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ABSTRACT

This handbook is designed to help local and state vocational education evaluation personnel conduct studies to measure the training and job satisfaction of former vocational education students. It consists of eight chapters. Chapter 1 explains the rationale, development, and organization of the handbook. Chapter 2 is composed of two commissioned concept papers on the state of the art, problems, and issues of measuring training and job satisfaction. Basic evaluation considerations (identifying relevant decision makers and information users, writing study objectives, determining respondents, choosing research designs, and selecting an evaluation instrument) are discussed in chapter 3. Chapters 4-6 explain the following alternative data collection methodologies: mailed questionnaires, interviews, and qualitative methods. Some descriptive and inferential statistics that are appropriate in analyzing and interpreting data on training and job satisfaction are examined in chapter 7. Chapter 8 explains some strategies for data presentation and utilization. A glossary, an annotated bibliography, and a selected bibliography follows. (A series of related handbooks on vocational education evaluation are available separately through ERIC--see note.) (MN)

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Research & Development Series No. 211

EVALUATING STUDENT SATISFACTION

Measurement of Training and Job Satisfaction of Former Vocational Education Students

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U.S. DEPARTMENT OF HEALTH,
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FOREWORD

This publication is one in a series produced by the National Center for Research in Vocational Education handbooks on vocational education evaluation. A primary purpose for this handbook series is to offer assistance to persons working to increase the quality of vocational education. Reflected in all publications of the handbook series is the intent to advance the theory and practice of evaluation. Specifically, the material presented in this handbook will help provoke, stimulate, and lead the way toward more reliable and valid assessments of former vocational education students' job satisfaction and training satisfaction.

This handbook was developed by the Evaluation and Policy Division, the National Center for Research in Vocational Education under a contract with the U.S. Department of Education, Office of Vocational and Adult Education. The National Center is particularly indebted to Stephen J. Franchak, Project Director; Eliseo Ponce, Graduate Research Associate, and Elizabeth Jen, Graduate Research Associate who had the primary responsibilities for the preparation of this document. Also, recognition and appreciation are extended to Robert Billings, Assistant Professor of Industrial Psychology, The Ohio State University; Patrick O'Reilly, Assistant Professor of Vocational-Industrial Education, Virginia Polytechnical Institute and University; and Richard Erickson, Chairperson and Professor of Vocational Education, University of Missouri-Columbia who contributed original drafts of concept papers that were used in the development of this handbook.

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Robert E. Taylor
Executive Director
National Center for Research in
Vocational Education

EXECUTIVE SUMMARY

Concern about the changing "work ethic," "quality of working life," and economic problems associated with productivity has implications for assessing former students' job satisfaction and their satisfaction with their education and training. These factors have been addressed in previous research but only in a limited manner. At the present time, the continued concern for lagging productivity and chronic youth unemployment points to the need for greater attention to these factors and their relationships to vocational education.

According to the literature, evaluation efforts have traditionally been considered to be inadequate, particularly in regard to having an impact upon program improvement. Several reasons have been posited to support this statement, such as (1) programs often have multiple (and sometimes conflicting) goals that are difficult to evaluate, (2) programs are complex and dynamic, and (3) often traditional research designs are used inappropriately to answer the evaluation questions.

However, evaluation efforts are still included as an integral part of program activities as essential for evaluation, accountability, and program improvement. It is apparent that there is a need for providing evaluators and users of evaluation information with guidelines and practices for the increased use of evaluation information. For example, the 1976 vocational education legislation reflects the need for interrelating evaluation findings from Vocational Education Data Systems (VEDS), state and local advisory council vocational education reports, and other evaluation efforts.

This handbook is primarily designed for local and state vocational education evaluation personnel who are faced with any of the following problems: (1) lack of research expertise to conduct studies on training satisfaction and job satisfaction, and (2) lack of adequate resource (time and money) to perform systematic evaluations.

In an attempt to make this handbook relevant to the needs of people in the field, selected state and local vocational evaluation personnel were asked to review the outlines and the drafts of the handbook with particular focus on the substantial contents and formats. Their suggestions and recommendations were analyzed and incorporated into the present form of the handbook.

The handbook has eight chapters. Chapter 1 explains the rationale, development, and organization of the handbook. The next chapter is composed of two commissioned concept papers on the state of the art, problems, and issues of measuring training satisfaction and job satisfaction. Chapter 3 discusses some basic evaluation considerations. The succeeding three chapters, 4 to 6, explain the following alternative data collection methodologies: mailed questionnaires, interviews, and some qualitative methods. Chapter 7, Data Analysis and Interpretations, exposes the reader to some descriptive and inferential statistics that are appropriate in analyzing and interpreting data on training satisfaction and job satisfaction. The last chapter, chapter 8, explains to the reader some strategies for data presentation and utilization.

Whenever appropriate, checklists are provided to give the reader a simulated field experience; and, to the extent possible, each section has been written to provide the reader sufficient background and information. Key references were also incorporated in the different chapters as aids for those readers who may be interested in pursuing a topic in greater depth. In addition, the handbook also contains selected annotated bibliographic entries and references.

CHAPTER 1

INTRODUCTION

With inflation, high energy cost, and a slowing economy, it is becoming increasingly difficult for schools to obtain additional operation monies from both the taxpayers and government. Many local communities have difficulty passing referenda for increased school levies. Additionally, many states and local governments are experiencing budget problems. Thus, most education agencies are financially hard-pressed to maintain present vocational programs and even harder-pressed to expand or to open new programs. The present financial squeeze, therefore, demands greater emphasis on cost effectiveness and cost benefits in the delivery of vocational education, and thus requires that decision making and planning in vocational education be more scientific—i.e., objective, systematic, and based on quality factual information. To base decision making on hope, good intentions, and doubtful information is to invite biased and ill-informed judgments, costly mistakes, and even loss of taxpayers' support.

Legislators have recognized this nationally increasing need for quality evaluation data, and it was partly this concern that resulted in the Education Amendments of 1976. Among other things, this Act requires the state board, during the five-year period of the state plan, to evaluate in quantitative terms the effectiveness of each formally organized program or project supported by federal, state, and local funds. These evaluations shall be in terms of the following:

a. Planning and operational processes, such as quality and availability of instructional offerings

b. Results of student achievement

c. Results of student employment success (sec. 104-402, Rules & Regulations of P.L. 93-112 as amended)

This handbook takes the view that perceptions of former vocational students regarding their vocational training and jobs provide valuable information for accountability purposes, and for effective decision making in both state and local education agencies. Students who have been in programs provide one of the best sources for insights and information as to the quality of vocational program offerings. Additionally, some educators view job satisfaction as one outcome of vocational education that needs consideration in determining student employment success.

Why Is the Handbook Developed?

This handbook is primarily designed for local and state vocational education evaluation personnel who are faced with any of the following problems: (1) limited expertise in evaluation and research methods, and (2) inadequate resources to conduct systematic evaluation studies. Despite these limitations, local and state education agencies must recognize the need for valid and reliable evaluation data. The fact, however, is that many local and state vocational education agencies are presently measuring the training and job satisfaction of former vocational students as part of their follow-up studies (O'Reilly and Ashe 1979; Gray et al. 1978; Mertens et al. 1980). The problem is that many of these studies are fraught with serious methodological flaws, making the efforts less than useful (Mertens et al. 1980).

How Was the Handbook Developed?

The major thrust in the development of this handbook was to produce a reference that is of practical importance to evaluation personnel—one that should help them solve their common problems in measuring the training satisfaction and job satisfaction of former vocational students. With this objective in mind, an effort was made to conduct a systematic survey of the literature, to get ideas from leading practitioners in the field, and to review exemplary systems and instruments. Concept papers on the state of the art including problems and issues were commissioned from recognized field and academic practitioners. These papers helped to develop the theoretical framework for this handbook. In addition, the experiences of the project staff and the Evaluation and Policy Division of the National Center have served as a foundation for the materials contained in chapters 3, 4, 6, 7, and 8.

In an attempt to make this handbook relevant to the needs of practitioners, selected state and local vocational evaluation personnel across the country were asked to review the outlines and the drafts of the handbook with particular focus on the substantive contents. Their suggestions and recommendations were analyzed and incorporated in the present form of the handbook.

How Is the Handbook Organized?

This handbook addresses two distinct activities: measuring training satisfaction and measuring job satisfaction. Two major factors influenced this decision to combine the two activities into one handbook. First, as mentioned earlier, state and local education agencies generally address both training and job satisfaction in their former student follow-up studies. Second, the same methodological principles and practices for measuring training satisfaction also apply for measuring job satisfaction.

The text is divided into chapters. Briefly, chapter 1 presents the rationale of the handbook, while chapter 2 explains the concept papers on the state of the art, problems, and issues of measuring training satisfaction and job satisfaction. The next three chapters, 3 to 6, discuss some basic evaluation considerations and alternative data collection methodologies appropriate for measuring training and job satisfaction of former vocational students. Every chapter is designed to enable the readers to identify the advantages and disadvantages of each method, to understand the mechanisms of the different methodologies, and to determine the appropriate methodology for a particular condition. Chapter 7 deals with data analysis and interpretation; chapter 8 discusses data presentation and utilization. Like the previous four chapters, exercises and checklists are provided, whenever appropriate, to give the reader a simulated field experience; and, to the extent possible, each section has been written to provide the reader sufficient background and information to understand the concepts being presented. Here too, key references have been incorporated as aids for those readers who may be interested in pursuing a topic in greater depth. The handbook also contains an appendix of selected annotated bibliographic entries and references.

Before proceeding in reading this handbook, you may find it worthwhile to assess your present knowledge and skills by completing the Training Satisfaction and Job Satisfaction Profile (checklist 1).

The profile is designed to help you in these areas:

- To think through the process of measuring the training and job satisfaction of former vocational students
- To become familiar with the issues you may not have considered
- To gain an overview of the contents of this handbook
- To decide which part or section of this handbook you should skim, read carefully, or study in depth

To complete checklist 1, rate your current level of knowledge of each question by darkening the appropriate circle in the left-hand column. The page number on the right identifies the location of the information in the text that is helpful in addressing the question. The following is an example:

Current Level of Knowledge/Skills			*Questions*	*Pages*
None	Moderate	High		
○	●	○	1. Why should the training and job satisfaction of former vocational students be measured?	9
○	○	●	2. What are perceptions?	10-11
●	○	○	3. How should relevant decision makers and information users be identified?	36-37

CHECKLIST 1:

Training and Job Satisfaction Profile

Current Level of Knowledge/Skills None	 Moderate	 High	Items	Pages
☐	☐	☐	1. Why should training and job satisfaction of former vocational students be measured?	9
☐	☐	☐	2. What are perceptions?	10- 11
☐	☐	☐	3. What factors influence training satisfaction?	10
☐	☐	☐	4. What are the common problems in measuring training satisfaction?	11- 20
☐	☐	☐	5. What is job satisfaction?	22
☐	☐	☐	6. What factors influence job satisfaction?	23- 25
☐	☐	☐	7. What are the common problems in measuring job satisfaction?	27- 32
☐	☐	☐	8. How should relevant decision makers and information users be identified?	36- 37
☐	☐	☐	9. How are objectives of the study written?	37- 39
☐	☐	☐	10. How are respondents determined?	39- 43
☐	☐	☐	11. How are appropriate research designs for the study chosen?	43- 46
☐	☐	☐	12. When should a mailed questionnaire be used?	49- 52
☐	☐	☐	13. How can confidence in a data-collected-by-mail questionnaire be increased?	52- 69
☐	☐	☐	14. How are questions to be asked determined?	53- 55

Checklist 1 (continued)

None	Moderate	High		Pages
☐	☐	☐	15. How are questions worded?	56- 59
☐	☐	☐	16. How are response options constructed?	59- 65
☐	☐	☐	17. Why pretest questionnaires?	65- 67
☐	☐	☐	18. How can the generalizability of a data-collected-by-mail questionnaire be increased?	67- 73
☐	☐	☐	19. How are questionnaires properly formatted?	67- 68
☐	☐	☐	20. What are some strategies for stimulating response?	68- 70
☐	☐	☐	21. How can nonresponse bias be dealt with?	70- 73
☐	☐	☐	22. When should interviews be used?	77- 78
☐	☐	☐	23. How can confidence in the data-collected-by-interview be increased?	78- 86
☐	☐	☐	24. How can the questionnaire be used in interviewing?	80- 81
☐	☐	☐	25. How can probing be effectively conducted?	81- 82
☐	☐	☐	26. How can interview bias and social-desirability bias be minimized?	83- 86
☐	☐	☐	27. How can the generalizability of data collected by interview be increased?	86- 88
☐	☐	☐	28. What are qualitative evaluation methods?	93- 94
☐	☐	☐	29. Why use qualitative evaluation methods?	93- 94

Checklist 1 (continued)

None	Moderate	High		Pages
☐	☐	☐	30. What is participant observation?	94
☐	☐	☐	31. Why use participant observation?	95- 96
☐	☐	☐	32. What are the strategies for successful observation?	9
☐	☐	☐	33. What are unobtrusive measures?	97-101
☐	☐	☐	34. Why use unobtrusive measures?	97-101
☐	☐	☐	35. What are some statistics for summarizing data?	103-107
☐	☐	☐	36. What are some inferential statistics for making generalizations?	108-114
☐	☐	☐	37. What are univariate procedures?	108-109
☐	☐	☐	38. When are univariate procedures employed?	110
☐	☐	☐	39. What are multivariate procedures?	109-114
☐	☐	☐	40. When are multivariate pr procedures employed?	112-113
☐	☐	☐	41. How do you present data and information on student satisfaction with their training and job?	117-125

CHAPTER II

STATE OF THE ART, PROBLEMS, AND ISSUES

This chapter presents two concept papers on the state of the art, problems, and issues of measuring training satisfaction and job satisfaction of former vocational students. Patrick A. O'Reilly, assistant professor at the Virginia Polytechnic Institute and State University, explains the meaning of perception and the limitations of using perception as a basis for determining the effectiveness of vocational training programs. He argues that student perception is influenced by a number of variables outside the training process itself and that these are beyond school control. Additionally, there are methodological problems associated with measuring training satisfaction.

The second paper, by Robert S. Billings, assistant professor at The Ohio State University, presents the meaning of job satisfaction, the factors influencing it, and the problems and issues of measuring it. Billings points out that the effects of vocational training on job satisfaction may be small, due to the many causes of job satisfaction. For this reason, data on job satisfaction should be used with caution.

MEASURING AND USING TRAINING SATISFACTION OF FORMER VOCATIONAL STUDENTS

by
Patrick A. O'Reilly*

It has become increasingly common, and popular, to seek input from students regarding the value of educational programs in which they are or have been involved. Such input is sought when planning as well as when evaluating programs, and one procedure frequently used is to conduct follow-up studies. Student evaluation of teachers and teaching, as well as of curriculum and training experiences, has become especially common in postsecondary and four-year institutions. One reason for the popularity of follow-up studies in the field of vocational education is that they are mandated; another reason is that follow-up can produce the kinds of product evaluation information needed by program planners and evaluators.

In vocational education one method frequently used to obtain evaluation information about programs is to collect data from former students regarding the degree of satisfaction that they have experienced regarding their training programs. This information is most often collected as part of a follow-up effort to determine the individual's employment status. Whether or not the information actually represents students' satisfaction has not been widely investigated bv vocational educators.

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*Assistant professor, Virginia Polytechnic Institute and State University.

Perceptions—What They Are

Some disagreement exists among psychologists regarding what a perception actually is or is not. One group would define it as "the process of information extraction" (Fargus 1966, p. 1). Or perhaps it would be more exactly defined as "a process of organizing, coding, and interpreting raw sensory input or experience—things seen, heard, felt, tasted, and smelled" (McCandless and Evans 1973, p. 190). This group views the process called perception as having two steps: the first, the sensing or collecting of information; the second, the interpretation of that information or derivation of meaning from the information gathered. Additionally, the two steps of the process are seen as being separate (Bigge 1964). On the other hand, a second group of psychologists would contend that perception is a unitary process and that sensing or collecting information occurs simultaneously with finding meaning or interpreting information. They consider perception to be highly selective since what information is collected depdnds on what it means to the individual and since that meaning is affected by the information that is collected (Bigge 1964). Kingsley (1957) partially bridges the gap by contending that perception ranges from the minimal level of merely gathering information or acknowledging that something exists, to using past experiences and training to make appropriate interpretations. In any case, the major differences between the two groups seem to revolve around the issue of selectivity.

A clear-cut definition of perceptions seems elusive since it is easier to determine what they are not rather than exactly what they are. However, in the strictest sense the term is being misused by those who claim to be collecting *perceptions* held by former students regarding the value of their training. What they are really interested in are the *judgments or opinions* that former students hold regarding the value of their training. While that distinction may be a rather technical point, it is quite important. The word perception connotes more validity and reliability than the words judgment and opinion imply. Therefore, it should be clearly noted that the information collected represents judgments or opinions—not perceptions, but the products of perceptions.

Problems and Issues in Collecting and Using "Perceptions"

One of the major problems in collecting and using "perceptions" has already been identified, that being that what are commonly called "perceptions" are not perceptions, but in fact judgments or opinions. As previously discussed, although it may seem to be semantic or technical trivia to make this distinction, it is not the case if using the term "perceptions" attributes more validity and reliability to the data than they deserve. When this major point is recognized, other problems or issues can be investigated. Much of what is discussed has its origin in the field of perceptual psychology and thus will deal with factors that affect actual perceptions and that are relevant to this discussion since judgments are based upon, though not synonymous with, perceptions.

Individuality

One of the first problems to be faced is individuality. Every human being is a unique person, a fact often accepted in theory, but less often in practice. It affects all aspects of education and is particularly important when an attempt is being made to measure how an individual feels about something. To believe that judgments can be reached with total objectivity is unrealistic. Combs, Richards, and Richards (1976) state that individuals develop their unique "reality world" on the basis of their ideas, values, concepts, and beliefs about the world around them. The bases from which they make judgments are a product of their background and experiences. Thus every individual uses a different set of criteria when making evaluations and arriving at judgments. In some instances those differences are unimportant, in others very important. Differences are minimized if trained evaluators make the judgments. Kingsley (1975) points out that training can improve the validity and reliability of perceptions and therefore of judgments. That is, training can improve objectivity, and it is obvious that few former students have such training.

Values

What an individual values has an effect on how events are perceived, and consequently on what judgments evolve concerning those events. Not only do the personal values of individuals affect their judgments or opinions, but the values of their peers or work group are also a factor. Dember and Warm (1979) conclude that experimentation indicates that the value attached to something affects how it is perceived. Thus individuals who, because of their background, place a high value on education are likely to make more positive judgments about their training than individuals who value education less. Since individuals tend to reflect the values of their peer group, former students working in an environment where on-the-job training and experiences are more respected than formal training tend to make less positive judgments than those working in environments where formal training is highly regarded by coworkers and is considered a key to promotion.

Needs and Expectations

Needs and expectations are closely related to, and have an effect on, the worth attributed to things and events. Probably the most important need any person has is the need to feel adequate, and to feel worthy. Evaluations that will protect one's feelings of adequacy are based upon what the individual believes to exist. Therefore persons who have invested considerable time and effort in completing a training program, especially if they have performed well in the program, have a tendency to justify that time and effort by rating the value of the training high.

Fordon (1976) indicates that any given characteristic of a training program may be a source of satisfaction or dissatisfaction depending upon the view individuals hold and their needs. Because people enter into activities with certain expectations regarding how the activity will be conducted and its outcomes, these expectations tend to mold, or at least focus, their judgments as to the value of those activities. Bruner (1973) points out that perceptions are a result of, and dependent upon, expectations, and that judgments are based on how well the expectations are fulfilled. It is impossible to know the expectations of all students who enter a vocational program or even whether their expectations are realistic. All that is known is that they have expectations that will affect their judgment regarding the value of the program.

Situational Factors

There are a number of situational factors that can and do have an impact on a person's judgments about an experience. The pre- and posttraining experiences combine to form the environment from which an individual makes judgments about value, and most of these experiences are outside the classroom or lab and beyond the control of educators. Among the situational factors that may affect former students' judgment regarding the value of a program are the following: their experiences in other educational programs prior to and following the program being evaluated; the economic climate and whether or not jobs are available; and the extent to which job requirements match training. What individuals perceive is based on what they have learned to perceive, their past experience, and the current situation.

Educational experiences prior to a vocational program are important factors in determining what kind of experience individuals expect to have during their training programs. Although those expectations are largely beyond the control of vocational teachers, they can have either a positive or negative effect on the students' evaluation of their training. Likewise, posttraining experiences with other educational programs can affect former students' level of satisfaction with their training. If they enter advanced training programs and do well, they are more likely to rate the program favorably than if they do poorly, regardless of other factors that may have contributed to their performance.

The number of jobs available and state of the economy are not only beyond the control of a vocational teacher but difficult to predict. Vocational programs, because of their purpose, foster an expectation in many students that they will be able to go to work in the trade area immediately after completing their training. Such expectations may or may not be realistic. However, if expectations are not fulfilled, the former students' satisfaction with the program will be affected.

The matching of job to training is a particularly difficult problem for vocational programs that are generally designed to provide the basic skills and knowledge necessary for a typical entry-level job in a particular trade or occupation. The job requirements of entry-level positions vary widely within the same occupation depending upon the industry or setting in which the individual is employed. This variability in the work place is beyond the control of educators but will undoubtedly affect how valuable former students consider their preparation to have been.

Quality of Training or Satisfaction with Training

Another issue is whether former students' "perceptions" represent a measure of the quality of the training provided or merely a measure of their satisfaction with the training. In many instances, the questions used to determine "perceptions" actually use either the word satisfaction or satisfied. Even though carefully worded questions may indicate that a judgment or opinion regarding quality is what is desired, it is a fairly safe assumption that much of what is measured is still satisfaction. Hinds (1975, p. 43) cautions, "Beware of courses that classes enjoy." What is important is to find out why they enjoyed them. Was it because they learned useful knowledge and skills or because the instructor was an entertaining and nice person?

Satisfaction is most often related to the attainment of personal goals and objectives that evolve from personal needs, values, and expectations. The attainment of those goals and objectives is often largely dependent upon opportunity and environmental or situational factors. The extent to which students' personal goals and objectives coincide with the goals and objectives of the training program is generally unknown. However, it is safe to speculate that the match is most often considerably less than perfect.

Probably few vocational education programs have as a primary objective that students be satisfied with the training. As educators we would like to meet the stated program objectives and satisfy all students at the same time. However, that is not always possible and what is most important is to meet the program objectives, assuming that they are valid and reasonable. As Hinds (1975) points out, the important aspect of evaluating training is not whether it was enjoyable but whether the students learned something they could use.

Thus it would seem that the degree to which former students are satisfied with the training provided is not necessarily a measure of the quality of that training. However, satisfaction data have been used and reported as if they were measures of quality and are sometimes more highly regarded than data measuring program quality.

Measurement

As a preface to the specific problems in measuring "perceptions," a review of the problems psychologists have encountered in measuring actual perceptions is indicated. It is worthwhile to identify those problems since what a person perceives forms the groundwork for the judgments or opinions often called "perceptions" or satisfaction. Combs, Richards, and Richards (1976) point out that the only way to learn how persons see themselves or the world around them is to ask them. Psychologists call that technique introspection. Some of them have concluded that it is too inaccurate and unreliable to be useful. The following problems with introspection were identified:

1. Degree of the subjects' awareness
2. Errors in communication or misinterpretation
3. Social expectancy (e.g., peer pressure or the pressure to give socially acceptable answers)
4. Cooperation of the subject (e.g., openness, willingness to participate)
5. Freedom from threat and degree of personal adequacy
6. Change in field organization due to change in focus and thereby in the perception created when question regarding perception is posed

The specific problems program evaluators encounter when collecting former students' "perceptions" are in many ways identical or related to those identified by psychologists.

Although almost all follow-up questionnaires promise anonymity, the extent to which recipients of the questionnaires believe that anonymity actually exists is unclear. Probably, lack of faith in the condition of total anonymity is more universal than faith in its existence. Thus, to some degree, such questionnaires represent a threat to most recipients, especially when opinions or judgments are sought, and this threat may affect individuals in various ways.

First, they may choose not to respond. That raises the possibility of nonresponse bias in the data collected, since the judgments or opinions of those individuals who do not respond may be quite different from the opinions of those who do. The evaluator is then caught in a dilemma. To use the data as collected may be to misrepresent the situation, but to contact nonrespondents in an effort to collect data may increase their feelings of being threatened or may reinforce the belief that anonymity does not really exist. However, it is generally agreed that it is better to attempt to collect data from nonrespondents and to determine the extent of nonresponse bias, if it exists.

The second way recipients may be affected is to choose to respond by providing socially acceptable or what they believe to be the desired responses. Such a situation creates response bias. Rosenberg (1964) concludes that such a situation is a result of evaluation apprehension, an "active, anxiety-toned concern" on the part of the subject to win a positive evaluation of personal adequacy or at least to provide no ground for a negative evaluation. It would seem that response bias generally results in responses that are more positive than actually warranted. However, that is not always the case.

A final issue is the question of motive. There is some evidence to indicate that people with very strong feelings, either positive or negative, respond more readily than less opinionated individuals. Their motives for responding may be negative or positive. Additionally, respondents attribute some of their motives to the manner in which the evaluation was conducted. Thus, the motive of the respondents and their interpretation of the motives for the evaluation may also create a response bias.

The stability of satisfaction, in itself, is questionable. Lokiec (1973) states, "Human satisfaction is brief and is never complete" (p. 988). Satisfaction is largely a product of time and circumstance, and as these change, so too may level of satisfaction. Pre- and posttraining experiences affect level of satisfaction, and it is impossible to measure their effect accurately or to negate them. Likewise, satisfaction and judgments about value may be affected by time. They may well depend upon whether enough time has elapsed to allow the benefits, if any, of the training to occur. In the absence of sufficient time, former students must deal with abstract rather than immediate gratification. The degree to which they are able to do so will affect their level of satisfaction and their evaluation of the worth of the program.

There are three additional issues that affect the reliability of the data called satisfaction with training or "perceptions." First is the fact that these data are based on memory. Learning theory includes the law of intensity, which states that people remember best and longest those things that are unusual, dramatic, traumatic, or exciting, and forget those that are routine and normal. Thus, as time increases between the actual experience and its evaluation, the impact of unusual events, positive or negative, will have an increased effect on the evaluation.

Second is the question of how accurately satisfaction or worth can be measured. Only relative values can be used to measure satisfaction or worth and those stem from the inclination and cultural background of the individual and the informal normals established by the peer group (Lokiec 1973). Additionally, the effectiveness of the device used to measure satisfaction or worth and the interpretation of results depend on the values of the person constructing the instrument and interpreting the results. There is considerable room for misinterpretation since the values of the evaluator may or may not match those of, or even be meaningful to, the respondent.

Finally, there is some evidence to indicate that when satisfaction or "perceptions" of worth are measured they change. Combs, Richards, and Richards (1976) contend that they change because the focus is on reaching a judgment. Judgments are multidimensional and the process used to arrive at a judgment involves making a series of complex tradeoffs (Lawson 1977). Being involved in such a process may change somewhat the very thing that was the original object of measurement.

How "Perceptions" Should Be Measured and Used

Before methods of measurement are decided, it would be best to determine whether "perceptions" must be measured. Although there is no specific federal requirement to assess former students' "perceptions" of the value or quality of their training or of their satisfaction with their training, the Education Amendments of 1976 require the evaluation of planning and operational processes including quality and availability of instructional processes. Some vocational educators feel that former students' perceptions with their training provide valuable data in meeting this requirement of the Act. However, collection of such data is a complex undertaking.

Measurement

The first step in planning any evaluation is to define its purpose. This definition will provide guidance in determining what data need to be collected and how they should be collected. Only those data necessary to fulfill the purposes of the evaluation should be collected. Thus, if one of the purposes of the evaluation effort is to determine how former students feel about their training, satisfaction or "perceptions" data should be collected; but if that is not a purpose of the evaluation, they should not be collected. If it is decided that satisfaction with training or "perceptions" should be collected, the next problem is to identify the procedures most likely to produce reasonably valid and reliable information.

One of the first things that should be done when collecting information is to make clear to the respondent exactly what is being asked. Thus it would be advantageous to call "perceptions" what they really are, rather than to confuse the issue with impressive terminology. What have commonly been called "perceptions" are actually judgments or opinions, and in many instances satisfaction with training is the area of concern. It is better to use those terms rather than the word perception because individuals are more likely to understand the type of information desired and the process to be followed in determining their response if the information sought is correctly identified.

Another helpful technique—one which is usually, but not always, possible—for improving the reliability and validity of the information gathered is to specify the criteria to be used in arriving at a judgment, thereby narrowing the focus of the evaluation. While it is still impossible to certify that all respondents used the same criteria to arrive at their conclusions they, at least, were instructed to do so. Specifying criteria establishes a mind set for the respondent, helps to clarify exactly what is being asked, and eliminates the need for guessing how the question should be answered. Additionally, it may also reduce or eliminate sources of personal bias such as attitude, mood, or recent experience.

Finally, there is the question as to when the former students' judgments, opinions, or level of satisfaction should be measured. Enough time must elapse that the effects of the training program have had a reasonable chance to develop; however, too long an interval may cloud the respondents' memories. The time when data should be collected is best determined by reviewing the goals and objectives of the program and deciding when the effects of training may be expected to develop.

Use of Information

Before a discussion of how former students' judgments of the value of their training and satisfaction with it can be properly used, the validity of such information must be briefly reviewed. In evaluating the extent to which "perceptions of effectiveness" of training are related to actual evidence of effectiveness, Blumenfeld and Crane (1973) found that no relationship exists. They therefore concluded that "perceptions" are opinions, not evidence of effectiveness, and should be recognized as such. Since the validity and reliability of such data are somewhat suspect, they should be used with extreme caution and for limited purposes.

Blumenfeld and Crane (1973) suggest that the utility of such information can be increased by supporting it with more specific data. Specifically, they recommend the use of a pretest, posttest research design with a control group. A research design of that nature provides the kinds of data needed for accurate assessment of program effectiveness and serves as a basis for evaluating the reality of former students' judgments and opinions. This approach is reinforced by Parker (1973), although his recommendations are more general. To gauge program effectiveness adequately, Parker suggests that four kinds of data are needed: posttraining job performance data, posttraining group performance data (i.e., how the training affected the group the individual worked with), participant satisfaction data, and participant knowledge-gain data. Blumenfeld and Crane would contend that without pretest data and a control group such an evaluation design is inadequate. However, it represents a definite improvement over the use of subjective data and opinions alone and is more likely to be used than the more scientific pretest, posttest research design with a control group.

One key to proper use of former students' evaluations of their training is to use the information for the specific purposes for which it was collected and to report it in the form in which it was collected. The validity and reliability of such data are suspect enough that to use them in post hoc fishing expeditions, especially of a cause-effect nature, is risky, and perhaps unethical. Reporting the information in a different form than that in which it was collected also raises questions of ethics and propriety. One common questionable procedure is the combining of response categories or options. If data are collected on a four-point scale of excellent, good, fair, and poor they should be reported on that four-point scale. To combine categories such as excellent with good and fair with poor masks the actual results. Evaluators must be willing to report results in the most accurate, straightforward manner.

When former students' evaluations of their training are reported, some explanation and interpretation should be provided. It is unfair and discourteous to the reader to do otherwise. Explanations should include how the data were collected, including the actual questions asked, and should alert the reader to the possible sources and types of bias that the data may include. Moreover, a reasonable and honest interpretation of what the data actually do and do not mean should be provided, including some discussion of what the data mean, for example, in light of such factors as the state of the economy or current job market. It is important that those who may use the data understand their limitations—limitations that can best be defined by whoever collected the data.

The judgments, opinions, and level of satisfaction of former students regarding their training are primarily useful for two purposes. They serve to indicate areas or aspects of the program needing further study; and although they do not provide the final answers, they can provide early warning of problems or indicate where possible strengths lie. Thus, they serve as a focus for more indepth investigations. Secondly, they have public relations potential. The data can be used to improve the image of the program within the ethical limitations of the data. The very fact that such data are collected can build good public relations, since many people like to be asked their opinions and like to feel that educators are interested in obtaining their evaluations. For that reason alone, the complex process of data collection may be worthwhile.

Summary

When the effectiveness of programs is evaluated, one of the types of data often collected is former students' satisfaction with their training in terms of their "perceptions" of the value of their experiences in the program. In fact, the term "perceptions" is a misnomer. The data collected are actually former students' judgments and opinions regarding their training and, as such, are subject to the influence of a variety of factors and circumstances, most of which are beyond the control of educators. Additionally, the extent to which such factors and circumstances affect former students' judgments is unknown. Thus, the quality of such information is questionable and must be used with caution.

There are a number of problems and issues regarding the collection and use of former students' judgments of the value of their training. Many of these problems and issues are related to factors affecting the validity and reliability of such data, for example, response and nonresponse bias, the situational nature of judgments, and how responses are affected by an individual's values, needs, expectations, motives, goals, and objectives. How these data are used is also at issue, since evidence indicates that they neither provide final definitive answers nor indicate cause and effect relationships. Furthermore, high levels of satisfaction with training experiences or positive judgments regarding the value of training are not, and should not be, used as indicators of program effectiveness or quality.

It is not mandatory that former students be given the opportunity to evaluate their training. Whether those evaluations should be collected is not an easily answered question. Neither is the question of how they should be collected. Guidelines for collecting such information include the following: only those data directly related to the stated objectives of the evaluation should be collected; the information should be collected as opinions or judgments and treated as such; efforts should be made to collect data that are specific rather than general and those that are related to program goals and objectives; the criteria to be used in reaching a judgment should be specified whenever possible; and the time for data collection can best be based upon the goals and objectives of the program and on common sense.

The value of this type of data is limited, especially when it is used without supporting data of a scientific nature. It is merely one type of data that should be collected in a comprehensive evaluation. When data of this nature are reported they should always be reported in the form in which they were collected and be accompanied by explanations and interpretations. Potential users of the data should be cautioned about their limitations. Measures of former students' judgments regarding the value of their training or satisfaction with their training are primarily valuable for two purposes, to indicate needs for further research and to improve building public relations. In combination with other data, they have the potential for assisting in making decisions about program improvement and for addressing accountability.

MEASURING JOB SATISFACTION IN THE EVALUATION OF VOCATIONAL EDUCATION

by

Robert S. Billings*

An evaluation of the impact of vocational education may include an assessment of the job satisfaction of program graduates. The goal of this paper is to facilitate such an assessment by (1) clarifying the nature of job satisfaction and its causes, (2) discussing the alternative questions that may guide the evaluation, (3) discussing the possible relationship between vocational education and job satisfaction, (4) suggesting and evaluating some research designs, and (5) discussing a series of issues that may arise in designing the instrument such as selecting an existing instrument as opposed to designing a new one, or deciding what item format to use. Throughout, a basic theme emerges: the choices to be made depend largely on the purpose of the evaluation.

Definition of Job Satisfaction

The most common definition of the concept of job satisfaction is as follows:

> The affective orientation toward or emotional reaction to the job (or various components of the job) resulting from the appraisal or evaluation of one's job or job experience against the standard of one's values (Lawler 1973 and Locke 1976).

This definition emphasizes two interrelated points. First, job satisfaction is a feeling or an emotion, and as such, is likely to have a strong impact on the lives of employees. Although job satisfaction is an emotion, it is not without foundation. The second part of the definition suggests that the feeling of satisfaction stems from a (more or less) careful evaluation of one's job—what it has to offer in various ways. Stated in a different way, there is a descriptive part of one's attitude toward the job (What is the job like? What does it offer?) and also an evaluative component (How satisfied are you with what the job offers?).

Job satisfaction can refer to the overall satisfaction with the job or to satisfaction with specific components (or facets or elements) of the job, such as pay, promotion opportunities, supervision, and so forth. These components can be fairly general (e.g., the nature of the work itself) or much more specific (e.g., degree of autonomy allowed in deciding what procedures to use when doing a specific task on the job).

A list of the most commonly used components of the job would probably include most of the following, although the list is illustrative and not exhaustive (summarized from Campbell and Pritchard 1976; Lawler 1973; Locke 1976). It includes work itself (intrinsic interest, variety, opportunity for learning, difficulty, amount to be accomplished, chances for success, control or autonomy of pace and methods, responsibility, use of abilities, feeling of achievement, opportunity to stay busy, authority, chance to do things for others, status or prestige); pay (amount, fairness or equity, method of payment, possibility of future raises); promotion (opportunities, basis for determining advancement, fairness, type offered); recognition (praise from supervisor, coworkers, outsiders);

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*Assistant professor, The Ohio State University working conditions (hours, rest breaks, equipment, temperature, ventilation, humidity, location, physical layout); supervision (overall style, influence over others in work place, technical skills, human-relations skills, administrative skills, consistency); coworkers (competence, friendliness, helpfulness); and company policies (concern for employees, specific policies toward unions, retirement, transfers, reputation of company, job security).

A Model of the Causes of Job Satisfaction

Satisfaction With Job Components

Lawler (1973) has summarized and evaluated the various models of the causes of job satisfaction, concluding with a consolidated model that has gained wide acceptance. A somewhat simplified version of this model is presented in figure 1 and discussed in some detail below in the following paragraphs.

Earlier it was suggested that the amount of job satisfaction results from an evaluation of the job. A pursuit of this point results in general agreement that level of satisfaction (overall or with a specific component) is a function of the discrepancy between what the person feels should be and what is seen as existing. With pay as an example, if an employee feels that compensation is less than the work merits, then that employee will be dissatisfied with pay. If the "should be" and "is" are in balance, the employee will be satisfied. If the amount received is greater than the employee believes the work deserves, a feeling of "guilt" or "over-compensation" results. (The discrepancy in this direction probably has to be fairly large for a significant feeling of guilt to occur, particulary for an aspect of the work like pay.) This part of a model of job satisfaction is substantiated by empirical evidence.

Although this model is fairly straightforward, it has some interesting implications. For example, two employees may have, objectively, the same opportunity for promotion and yet differ in satisfaction with this promotion opportunity. The differences in satisfaction may be due to (1) different perceptions of the opportunity for promotion (the "perceived amount" part of the model), and (2) different standards concerning what the chances for promotion "should be." This example emphasizes the point that the "should be" and "is" part of the model are judgments and are not necessarily objective or accurate.

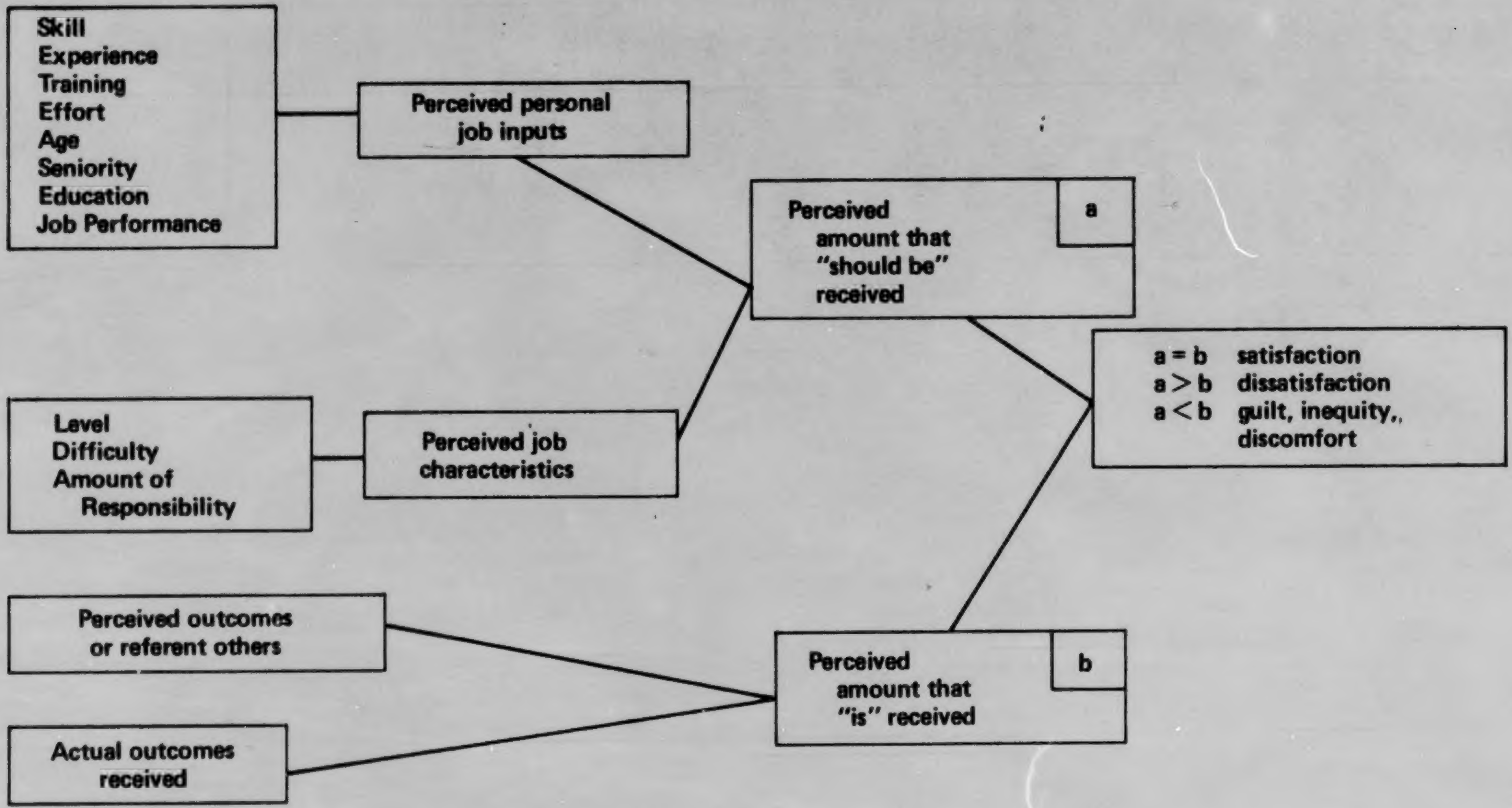
This model of job satisfaction also includes the determinants of the "should be" and "is" received perceptions. One of the determinants of "should be" are perceived personal job inputs. These include all of those things that individuals feel they contribute to the job, such as skill, experience, effort, performance, education, and so forth (see figure 1). The higher these perceived inputs, the greater the amount of work reward individuals feel they should receive. For example, if employees feel that they perform better than coworkers, then perceived inputs are high and the amount of outcomes that should be received is correspondingly affected.

The model suggests that perceived job characteristics also affect the perceived amount that should be received. The more demanding the job (e.g., the higher the level, the more difficult the work, the more responsibility required), the greater the outcomes (e.g., pay, intrinsic satisfaction, working conditions) that should be received from the job. For example, an employee who is given new, demanding job duties is likely to feel that the pay should be greater.

The determinants of perceived amount of the outcome that is received are simpler (see figure 1). Actual outcomes, of course, have the greatest impact on this perception. In addition, however, the

FIGURE 1

Lawler's Model of the Determinants of Satisfaction with Outcomes


Skill
Experience
Training
Effort
Age
Seniority
Education
Job Performance
Perceived personal job inputs
Perceived amount that "should be" received
a
Level
Difficulty
Amount of Responsibility
Perceived job characteristics
a = b satisfaction
a > b dissatisfaction
a < b guilt, inequity,, discomfort
Perceived outcomes or referent others
Actual outcomes received
Perceived amount that "is" received
b

E. E. Lawler, *Motivation in Work Organizations* (Belmont, CA: Wadsworth, 1973). Permission to reprint being requested.

the amount of the outcome believed to be received by others is important. Take as an example two computer programmers, each earning $20,000 a year. If programmer A's coworkers earn $18,000 then A will feel that the perceived amount of pay is relatively high. Programmer B, however, works alongside other programmers who make $22,000. B will perceive the current level of pay to be lower. Thus, assuming all other factors in the model to be equal for A and B, programmer A will be more satisfied with pay than B.

Before other models of satisfaction are examined and applied to vocational education, it should be noted that this model has received a fair amount of empirical support. The findings of many older studies can be reinterpreted in this framework and are generally consistent with the theory. In addition, a recent study by Dyer and Theriault (1976) specifically tested most of their model and found general support.

Overall Job Satisfaction

It is often hypothesized that overall job satisfaction is a result of some combination of satisfaction with the various components of the job. Further, it seems reasonable that the components most important to the individual somehow are weighted more than unimportant components in determining overall satisfaction. For example, an employee who values challenging work more than friendly coworkers will be more satisfied overall if satisfied with the nature of the work and dissatisfied with coworkers than if the opposite were the case.

Many studies have been conducted to test this suggested relationship of component satisfaction, importance of the components, and overall job satisfaction (Quinn and Mangione 1973; see Locke 1976 for a complete summary). The empirical results suggest a more complicated relationship. Evidently, individuals take importance into account when rating component satisfaction; important components are usually rated either very satisfying or very dissatisfying, while unimportant components are rated as more neutral. Thus, a separate rating of component importance is redundant with the component satisfaction rating. This redundancy implies that a simple sum of component satisfaction ratings is the best predictor of overall job satisfaction. However, it is wise to note that since important components are rated in a more extreme manner, the variability in the sum of the component satisfaction is mostly a product of the ratings of the important components. Thus, the importance of a component is valuable information and does have an impact on overall satisfaction, albeit indirect.

Regardless of the precise manner in which component satisfaction is combined to result in overall satisfaction, this way of viewing overall job satisfaction suggests that Lawler's model of component satisfaction also explains the causes of overall satisfaction. That is, the employee (1) judges, for each component of the job, the amount that should be received, (2) judges the amount that is received, (3) feels satisfied or dissatisfied as a result, and (4) combines all of the evaluations across components to determine overall satisfaction.

Issues To Be Considered

Having defined job satisfaction and presented a model of its causes, we now turn to a list of questions that should be addressed when evaluating the effects of vocational education on job satisfaction.

What is the Purpose of the Evaluation?

The first step in determining the purpose is to clarify the major questions that guide the evaluation. The aspects of job satisfaction selected for inclusion and the specific design used depend upon the precise question being asked.

Two major purposes seem likely:

1. What are the effects of vocational education as opposed to traditional education?
2. What are the effects of certain characteristics of the vocational education program?

The first question would probably be the major focus if the purpose is to justify the existence of the vocational education program, justify an increase in the size of the program, avoid cuts in the program, or decide which of several programs will be retained. The second question would apply if the purpose was to gather data to make decisions about the operation of the program. Examples of such decisions would include the amount of field experience given to students, the type of instructor hired, the training programs offered, and the content of curriculum.

While an evaluation could attempt to answer both questions simultaneously, the two questions do imply that different aspects of job satisfaction should be examined and do call for different research designs.

What Dimensions of Job Satisfaction are Expected to be Affected and Why?

The answer to the question of job-satisfaction dimensions depends upon the purpose of the evaluation. Accordingly, we will examine the two major purposes separately.

Effects of vocational education as opposed to traditional education. If the major purpose of the evaluation is to examine the effects of vocational versus traditional education, then the following question evolves: if vocational education students do not receive that education, how will their job satisfaction be different? There are several possible effects:

1. *Vocational education may decrease job satisfaction by increasing perceived inputs but not affecting perceived outcomes.*

This possibility follows Lawler's model of component satisfaction. In general, we can predict that good vocational education will increase job inputs, such as skills, training, education, experience, and perhaps job effort and performance. If job inputs are perceived as higher, then the vocational education graduates will feel that they should be receiving more and better work outcomes, such as better pay, more promotion opportunities, more intrinsically interesting job assignments, more autonomy, and better working conditions. In other words, vocational education may increase the level of aspiration for most to acquire more, if not all, work outcomes. The paradoxical conclusion is that better training may lead to lower satisfaction—if the heightened aspirations of "should be's" are not matched by the actual level of outcomes.

A further implication is that this "aspiration level" effect should be explored when evaluating vocational education. One simple way to do so is to ask graduates as to whether they feel that vocational education should mean more and better work outcomes. If so, exactly what do they think should be better—pay, promotion opportunities, autonomy? Finally were their work outcomes better—do they feel that they got better pay, because they were vocational education graduates? An analysis of these types of perceptions would help explain a lack of effect or a negative effect of vocational education on job satisfaction and also suggest which dimensions should be examined. Further, this may have more serious implications when assessing the job satisfaction of special populations such as the handicapped and disadvantaged individuals.

2. *Vocational education may increase job satisfaction because it leads to better jobs for its graduates.*

If this is the presumed mechanism behind the effects of vocational education on job satisfaction, then the logical thing to do is to demonstrate that the jobs obtained are different. Further, the dimensions of job satisfaction to be examined are therefore those that deal with the job characteristics that are better because of better placement.

The following elements of the job might be expected to be better due to vocational education, depending upon the circumstances: pay, promotion, working conditions, and the work itself. Other job characteristics would seem less likely to be affected: the nature and quality of supervision, relations with coworkers, and company policy which would probably be more strongly affected by the specific organization than by the level or quality of the job obtained.

It must be noted that the dimensions of job satisfaction that are affected by vocational education will depend heavily on the types of jobs involved. Further, if the objective of vocational education is better placement, then the key issues are the precise differences between the jobs obtained by vocational education graduates versus those of traditional program graduates. The decision as to which dimensions of job satisfaction to include in the evaluation will depend heavily on a prior analysis of this issue.

3. *Vocational education may have no effect on job satisfaction.*

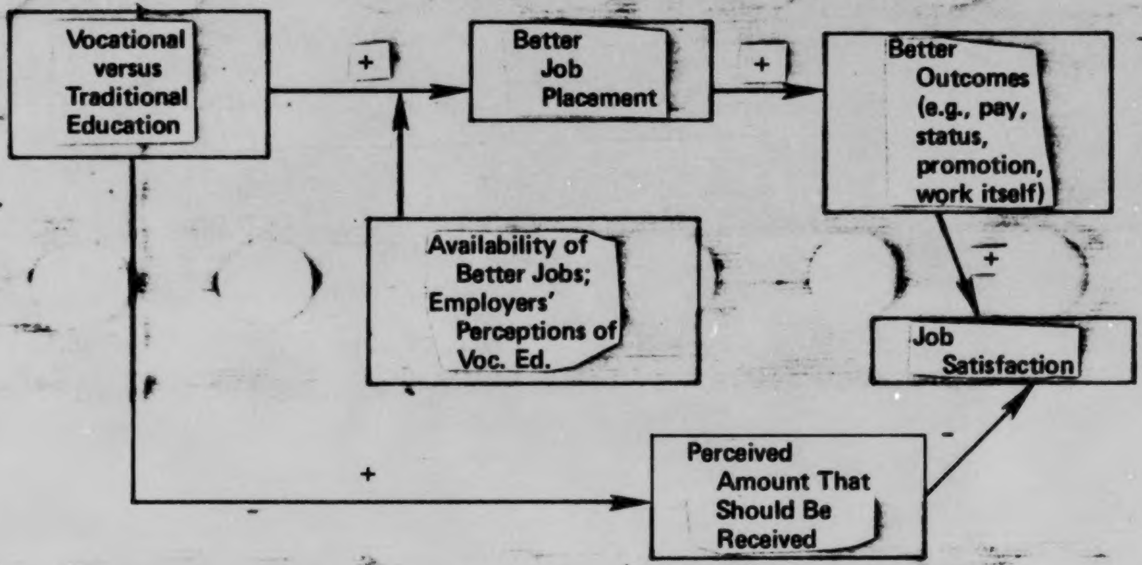
There are several reasons why job satisfaction may not be affected by vocational education. First, overall job satisfaction, being a composite of more specific satisfactions, may not be affected if satisfaction with some dimensions is enhanced (due to better placement), while satisfaction with other dimensions is reduced (due to unfulfilled expectations). Further, vocational education may affect satisfaction with some aspects of the job, while not affecting others. For example, satisfaction with supervision may not be affected. Such a pattern would dilute the impact on overall satisfaction. In addition, vocational education may increase the satisfaction with some components, have no effect on others, and decrease satisfaction with yet other components, due to the increased-aspiration mechanism previously discussed. To the extent that these different effects occur, the total effect on overall job satisfaction becomes unpredictable.

Job satisfaction may be unaffected by vocational education because job placement depends upon the availability of better jobs, and upon the assumption that better jobs are more likely to be obtained following vocational education. If vocational education graduates do have an advantage in competing for better jobs, then this happens because employers believe that vocational education graduates make better employees. Both of these variables—the rate of placement of vocational versus traditional graduates in good jobs and the beliefs of employers concerning vocational education graduates—can and should be assessed if a "job-placement" mechanism is believed to be occurring.

The foregoing discussion of these processes is summarized in figure 2. Note that the two opposing mechanisms are shown: (1) vocational education may raise job satisfaction by providing better job outcomes through better placement, or (2) it may lower job satisfaction by raising expectations that

FIGURE 2

The Possible Effects of Vocational versus Traditional Education on Job Satisfaction


Vocational versus Traditional Education
+
Better Job Placement
+
Better Outcomes (e.g., pay, status, promotion, work itself)
Availability of Better Jobs; Employers' Perceptions of Voc. Ed.
+
Job Satisfaction
+
Perceived Amount That Should Be Received
-

are not met. The key variables that determine which mechanism predominates seem to be the availability of better jobs and the likelihood that vocational education graduates actually will receive these jobs.

Effects of characteristics of the vocational education program. We now turn to the second broad question guiding the evaluation—what are the effects of certain characteristics of the vocational education program? First, why should such characteristics affect the job satisfaction of graduates? One possible assertion to begin with is that the job placement mechanism seems even less likely to be operating here than in explaining the effects of vocational versus traditional education. In order for such characteristics as extent of fieldwork and background of the teacher to influence an employer's decision to hire a vocational education graduate, the employer must be aware of these characteristics of the program and believe that they will produce better graduates. While this sort of effect is possible, it seems unlikely. Also, if a given characteristic is altered, then it takes some time for the change to affect the job satisfaction of graduates through the job placement mechanism.

A characteristic that may produce an effect on job satisfaction is the opportunity provided by vocational education for a realistic preview of the job or occupation, thus allowing students to decide whether that occupation fits their needs before taking the job. For example, nursing aide students may discover that the job does not hold as much interest as they thought after finding out, during training, what the job duties will be. An interesting implication of this point is that, in some cases, it may be a positive outcome if individuals learn during training, rather than after job placement, that they are not going to like the job.

The realistic job-preview literature, which is well summarized by Wanous (1980), would suggest that job satisfaction (and lower turnover rates) are produced by providing complete and accurate information—both positive and negative—about the prospective job. Applied to vocational education, the implication is that certain characteristics of the program may enhance subsequent job satisfaction. Specifically, any element of a program that helps provide an accurate picture of the vocation will make job satisfaction more likely. Such elements include instructors who have experience across a variety of organizations and positions in the vocation, opportunities to spend time in an organization doing the actual work (provided the position and organization are representative and the work done is an accurate sample), and curriculum content that explores both the positive and negative characteristics of the vocation.

We can now turn to which dimensions of job satisfaction are likely to be affected by a vocational education program providing a realistic job preview. Research in this area, as summarized by Wanous (1980), found that overall job satisfaction has often been enhanced by fairly short and simple realistic preview interventions (e.g., booklets or films about the job, which give a balanced view). It is, therefore, not unreasonable to expect that a good vocational education program, which is much longer and more detailed, will have an even greater effect on realistic expectations and job satisfaction. This effect, however, likewise assumes that those who experience poorly managed vocational education programs enter the vocation with either uncertain or overly optimistic expectations.

It is more difficult to speculate as to which specific, as opposed to overall, dimensions of job satisfaction are likely to be affected by vocational education practices providing a realistic preview. It would seem to depend upon which aspect of the vocation would be perceived unrealistically due to poor vocational education. I could imagine a vocational education program that emphasizes only the interesting and challenging aspects of the work, because these are fun to teach and make it easier to maintain student interest. However, such an approach is likely to reduce the satisfaction with the work itself, if the subsequent jobs are disappointing in challenge and variety. Also, it is possible to imagine that a poor vocational education program may create unrealistic expectations about promotion and career opportunities, pay levels, and working conditions.

It is up to those designing the evaluation to analyze fully the intended effects of the program elements to be evaluated. Perhaps a survey of vocational education graduates will identify areas producing unfulfilled expectations, will suggest certain program changes, and will guide the subsequent choice of job satisfaction measures for the evaluation.

A Final Comment

Writing a paper such as this is somewhat frustrating, for there are too many issues that are important and too little space. Conducting evaluation research is a most difficult task because the entire process of defining the problem, operationalizing the variables, determining the research design, putting together the instrument, collecting the data, and making sense of the results requires multiple skills. Moreover, there are a frustrating number of choices to be made with inadequate information. If this paper has provided some insight into any of these difficult choices, then my goal has been accomplished.

CHAPTER III

SOME BASIC EVALUATION CONSIDERATIONS

Michael Patton (1978, p. 22) bewails the fact that the "emergence of evaluation research has not meant a corresponding utilization of findings for rational decision making." A recent review of literature shows that there is great dissatisfaction with the lack of impact and usefulness of evaluation information (Alkin 1980, p. 14). Carol Weiss (1972, pp. 10–11) says:

> Evaluation research is meant for immediate and direct use in improving the quality of social programming. Yet a review of evaluation experience suggests that evaluation results have not exerted significant influence on program decisions.

Alkin (1980, p. 20) identified three major categories of factors influencing the ultimate utilization of evaluation findings: characteristics of the organization, characteristics of actors in the system (evaluators and decision makers), and characteristics of the evaluation. A number of specific factors in the process account for ineffective utilization of evaluation data (Patton 1978): fuzzy program goals, lack of methodological rigor, uncertain findings, lack of staff, little program cooperation, inconsistent state and county data processing systems, unclear decision-making hierarchies, political undercurrents, trying to cover too much, and inappropriate timing. Thus it can be seen that, while utilization of evaluation information is influenced by several variables, the evaluator's technical skill, ingenuity, and creativity constitute important determinants in the success of the utilization process. To a considerable degree, the evaluator determines what happens to the results of evaluation.

This chapter presents some basic evaluation considerations to promote the utilization of data collected by measuring former vocational students' satisfaction with their training and their jobs. This discussion includes (1) identifying relevant decision makers and information users, (2) writing the objectives of the study and determining the respondents, (3) choosing the appropriate research design, and (4) deciding whether to design your own instrument or to select an existing one.

Identifying the Relevant Decision Makers and Information Users

Unlike research studies that are designed primarily to add to the body of knowledge, evaluation studies are designed primarily to provide good information for decision making (Alkin 1980, p. 3). Other authors such as Weiss (1972), Patton (1978), and Stufflebeam (1971) echo the same view. The six major purposes of evaluation identified by Anderson et al. (1975, pp. 3–4) reflect this "dominant viewpoint":

1. To contribute to decisions about program installation
2. To contribute to decisions about program modification
3. To obtain evidence to rally support for a program

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4. To obtain evidence to rally opposition to a program
5. To contribute to the understanding of basic psychological, social, and other processes
6. To contribute to decisions about program continuation, expansion, or certification

Thus, to increase the use of evaluation information, the Joint Committee on Standards for Education Evaluation (1981, p. 13) requires "evaluators to acquaint themselves with their audience, ascertain the audience's information needs, gear studies to these needs, and report the information clearly when it is needed." Three important questions, therefore, evolve: Who are relevant decision makers and information users? What tvpe of information do different audiences need? When do they need the information? Needless to say, you need to answer satisfactorily these questions before you proceed to do the other parts of your study; they are basic to the formulation of your objectives. More importantly, your answers are crucial to the utilization of the information generated by your study.

There are no simple, universal rules for answering the questions posed to you. As you may realize, different types of organizations have different types of decision-making hierarchies, different political undercurrents, and different individuals responsible for decision making. In short, different organizations have different environments. Thus, it might be helpful to view information needs in terms of accountability, decision making, and program improvement at different organizational levels —school, district, state, and federal. Toward this end, you may like to consult the following sources (Morris and Fitz-Gibbon 1978, pp. 23-24):

- State and federal mandates and legislation
- Local and national concerns identified in editorials, articles, and legislation
- Parental concerns as voiced in letters, PTA and parent advisory meetings, and conferences
- Community concerns voiced by business organizations, pressure groups, and the like
- School records and reports, such as attendance, discipline, career choices of graduates, and test scores
- College requirements and employers' requirements for graduates
- Teachers' reports and comments
- [Former] student requests and comments
- Project proposals, final evaluation reports, and program descriptions of other projects in the same curriculum area
- Other schools that have developed programs in your area of interest

Checklist 2 is designed to help you identify the relevant decision makers in your organization.

Writing the Objectives of Your Study

In the previous section, you were asked to answer questions pertaining to (1) the identification of decision makers in and information users of your organization, (2) the listing of specific information needs of your target audiences, and (3) the determination of when your audiences need the information. Now, you are probably ready to proceed to the next phase of your study—writing the objectives.

Objectives are one of the most important parts of your evaluation study. They specify the desired outcomes; thus, they provide direction in terms of the data to collect, the time to collect them, the method or methods to employ, and the analysis and presentation of data collected.

CHECKLIST 2

Determining Appropriate Decision Makers and Information Users

Instructions: Examine the figures below and list the appropriate decision makers and information users for each phase of the vocational education program.

Phase of Vocational Education Program		Decision	Type of Evaluation	Appropriate Decision Makers and Information Users
Phase 1	Planning	Does the Program Address Top Priority Needs?	Needs Assessment	1. ____________ 2. ____________ 3. ____________
Phase 2	Implementing	How Can the Program Be Improved?	Formative Evaluation	1. ____________ 2. ____________ 3. ____________
Phase 3	Recycling	Has the Program Had An Impact?	Summative Evaluation	1. ____________ 2. ____________ 3. ____________
		Is the Evaluation Accurate and True?	Evaluation Audit	1. ____________ 2. ____________ 3. ____________

Adapted from K. Adams and J. Walker. *Improving the Accountability of Career Education Programs: Evaluation Guidelines and Checklists.* (Columbus, Ohio: The National Center for Research in Vocational Education, 1980).

In writing your objectives, you should keep in mind your target audiences and you should key your objectives to their data needs. To ensure that your objectives adequately reflect the intended outcomes, it is suggested that you draw a list of specific information needs of your target audience, with similar items grouped together in a category; then, you translate your lists into objectives.

Your objectives may be classified into two categories: broad and specific objectives. Broad objectives express the major purpose of your study. Specific objectives, on the other hand, express the specific outcomes of your study. Several specific objectives may constitute one broad objective. If specific objectives are written in measurable, concise, clear, and short statements, they can be the basis for stating questions to be included in the data collection instruments.

The example on table 1 illustrates how a list of specific data needs of different audiences is translated into broad and specific objectives.

Now, make your list of specific information needs and of your target clientele and translate them into broad and specific objectives. After you have written your objectives, take time to review them by completing checklist 3.

Determining Your Respondents

After the objectives of your study have been written, the next tasks are (1) to determine what relevant population(s) can furnish data to meet the objectives of your study, and (2) to identify the specific respondents from whom the data will be gathered.

It is suggested that you study your objectives and make a list of different groups of former vocational students. Indicate in each group the number of students and the data needed. From this list, you should be able to determine the relevant populations (i.e., groups of former vocational students) of your study. An example is given below:

Former Vocational Student	*Number*	*Data Needed*
Home Economics Class, 1979-1980		
1. Total	150	• Satisfaction with the team-teaching approach • Satisfaction with the new text books
2. Employed by the new food industries in the community	50	• Job satisfaction in terms of their pay, fringe benefits, and working conditions

From the example, it can be seen that two types of information are needed from all former home economics students. However, for those who are employed by the new food industries in the community, an additional piece of information is going to be collected—job satisfaction.

After you have determined your relevant population(s), your next job is to identify the specific respondents of your study, i.e., the selection of the former vocational students from whom data will be collected. Your decision depends upon several factors: objectives of your study, character-

TABLE 1

Translating Data Needs to Objectives: An Example

Data Needs

Student Satisfaction:

1. Local appliance manufacturer—wants to know the satisfaction of home economics students on the new appliances that were donated.
2. Local school board—expresses interest in knowing the satisfaction of students on the new prototype instructional materials in business and office education and health occupations
3. Local union officials—want to know the training satisfaction of students who were in the apprenticeship program.

Job Satisfaction:

1. Parents—express interest in knowing the job satisfaction of former students who are employed in the new factories in the community.
2. Management of new factories in the community—wants to know the satisfaction of their employees who were former vocational students relative to the various aspects of their jobs.

Objectives

Broad Objectives:

To assist target audiences in decision making and planning by providing them with information on the following:

A. *Former vocational students' satisfaction with their training.*

Specific Objectives:

1. To measure the satisfaction of former vocational students on the new appliances donated by XYL Company.
2. To measure the satisfaction of former vocational students in business and office education and health occupations on the prototype instructional materials.
3. To determine the satisfaction of former vocational students on the apprenticeship program.

B. *Former vocational students' satisfaction with their jobs.*

Specific Objectives:

1. To determine the job satisfaction (relative to pay, fringe benefits, working conditions, status) of former vocational students in the newly-established factories in the community.
2. To compare the level of satisfaction among former vocational students who are employed in the newly-established factories in the community.

CHECKLIST 3

Objectives of the Study

Instructions: Take time to review your objectives by answering the questions below:

Yes	*No*	*Questions:*
		1. Do the objectives reflect the needs of the following information users and decision makers?
☐	☐	• Parents
☐	☐	• Teachers
☐	☐	• Local school administrators
☐	☐	• Business and industry
☐	☐	• Labor
☐	☐	• State education agency
☐	☐	2. Do your broad objectives express the major purposes of your study?
		3. Are your specific objectives –
☐	☐	• Clearly written (i.e., they are free of words that are ambiguous, indefinite, and imprecise)?
☐	☐	• Concisely written (i.e., short and direct sentences)?
☐	☐	• Measurable (i.e., the objectives are stated in performance terms)?

istics of your population, and resources available. In cases where your population is small (perhaps only twenty-five), you may decide to use a complete innumeration survey. On the other hand, your population may be large (e.g. 1000); thus, it becomes very expensive to gather data from all members of the population. So, you may have to limit yourself to a few respondents selected at random from the total population of your study. Then, you use the information collected as if it represents the answers of the whole population. Three types of random samples are often used (Ackoff 1953, p. 124):

- *Simple random*—Assign to each population member a unique number; select sample items by use of random numbers.
- *Systematic*—Use natural ordering or order population; select random starting point between 1 and the nearest integer to the sampling ratio (N/n); select times at interval of nearest integer to sampling ratio.
- *Cluster*—Select sampling units by some form of random sampling; ultimate units are groups; select these at random and take a complete count of each.
- *Stratified cluster*—Select clusters at random from every sampling unit.
- *Repetitive multiple or sequential*—Two or more samples of any of the above types are taken, using results from earlier samples to design later ones, or determine if they are necessary.

If a decision has been reached to select a random sample, the evaluator needs to determine the specific sampling strategy. To reach such a decision, the evaluator needs to determine the type of sample that best serves the objectives of the study. For further discussion on sampling, as it relates to vocational education follow-up studies, the reader may refer to Evaluation Handbook #1: Guidelines and Practices for Follow-up Studies of Former Vocational Students (Franchak and Spirer 1978).

Checklist 4 is designed to help you determine your sampling plan.

Choosing the Appropriate Research Design

Earlier in this chapter, you were asked to study your objectives and identify the procedure for selecting your respondents. Your next job may involve choosing an appropriate research design. In doing this, the evaluator needs to consider the objectives of the study, the evaluation questions that need answering, the characteristics of the population, the time available to conduct the study, and the human and financial resources available. Additionally, you should consider the various rules and regulations that protect individuals' rights, for they set the "ethical" parameters for the methodologies that are available to the evaluator.

For example, a local school board might be interested in knowing the effects of vocational versus nonvocational education in terms of the graduates' job satisfaction. The perfect design would involve conducting a true experiment. Students would be randomly assigned to vocational versus nonvocational education and subsequently placed in identical jobs in the same organization. However, it is unlikely that the researcher will have the freedom to make these assignments. Instead, as an alternative design, an ex post facto research design is utilized. The job satisfaction of a group of vocational education graduates is compared to that of their coworkers in similar jobs in the same organization. This procedure would entail selecting (or having the employer select) one nonvocational graduate for each vocational graduate in the sample. Although such an approach would begin to control for the effects of job and organizational characteristics, individual characteristics (values, age, experience, and so forth) would not be controlled for, due to nonrandom assignment to groups. Even with these problems, this is the best of the feasible research designs.

CHECKLIST 4

Determining Your Sampling Plan

Groups	*Total N*	*Decision*			
		Total Enumeration	Simple Random	Cluster	Stratified
		(Check One)			
A. Types of Program*					
1. Agriculture	______	☐	☐	☐	☐
2. Business and Office	______	☐	☐	☐	☐
3. Health Occupations	______	☐	☐	☐	☐
4. Consumer and Homemaking	______	☐	☐	☐	☐
5. Distributive Education	______	☐	☐	☐	☐
6. Technical	______	☐	☐	☐	☐
7. Trade and Industrial	______	☐	☐	☐	☐
B. Special Needs Population					
1. Handicapped	______	☐	☐	☐	☐
2. Disadvantaged	______	☐	☐	☐	☐
3. Minority	______	☐	☐	☐	☐
4. Limited English Proficiency	______	☐	☐	☐	☐

* Depending on the objectives of your study, you may want to group your respondents by U.S. Department of Education 6-digit code.

Let us take another example. Your local superintendent wants to assess the effects of characteristics of the vocational education program. When the purpose is to evaluate a specific aspect of the vocational education program, then the ideal design would be to run parallel programs differing only in that one aspect, and to randomly assign students to the two programs. Whereas this design may be difficult to implement, it is not impossible, particularly where there are multiple classes and where assignment to classes is controlled by the administrator. If the effects of a program element are truly of interest, then a true experiment should be carefully considered. The strengths of this design cannot be overemphasized because any differences in subsequent job satisfaction can be inferred to have been caused by the differences between the programs.

An alternative design involves nonrandom assignment to the experimental and control groups, producing a nonequivalent control-group design. For example, when two classes differ on the characteristic under study, but have been placed by nonrandom assignment, a number of differences exist besides the one of interest. Another possibility is to study two groups of students, one that went through the program before a change and another, after the change.

Both of these examples produce groups that differ on variables other than the one under study. The characteristics of the students or the availability of good jobs may have changed over time, or the students may have self-selected themselves into the two different classes, on the basis of extraneous factors or on their knowledge of the design element being evaluated. Biases such as these may mask or overpower true effects or produce differences that are not due to the variable being studied.

A design that is generally stronger than the nonequivalent control group is an interrupted time-series design. If a change in the program is planned, then this design requires taking periodic measures before and after the change. Any significant differences in the pattern of the data from before to after the change can be used as evidence of the effects of the change. With an adequate timeline, the only threat to the conclusion based on this design would be other events occurring about the time of the change that might have caused the effects. It is possible to reduce the plausibility of this alternative by closely monitoring the program to make sure no other changes occur when the focal change is implemented.

The interrupted time-series design is most useful where measures can be easily taken on a regular basis. eor example, attendance in class, scores on weekly standardized quizzes, and student reaction to the course are quite possible to use in this design. Job satisfaction, however, would seem to be more difficult to measure with this design, primarily because before and after measures of job satisfaction cannot be taken from the same set of students. Rather, each student either graduates from a course taught before the change or a course taught after the change. This destroys the advantage of interrupted time-series design, for subjects can no longer act as their own control. Accordingly, if a true experiment is not possible, a nonequivalent control group design is the best design a researcher can use when examining the effects of vocational education on job satisfaction.

The foregoing examples illustrate the fact that in all instances, the evaluator's idealism needs to be tempered by the realities of the situation.

Another important consideration in choosing a methodology is data timeliness. This means that your information should be available at the time it is needed by your target audience. "Of what use is the grass if the horse is dead?" is an old saying. Currently applied, it becomes "Of what use are evaluation data, no matter how good, if they are not available at the time they are needed by decision makers?" In some instances, therefore, you may have to select a "less desirable" methodology using only "soft" data because of certain constraints, such as available time and resources. Patton (1978, p. 237) says:

> The challenge in selecting an evaluation method is to do justice to the question by *providing the most valid and reliable answers possible with the resources available* [italics added].

While some evaluators may find it difficult to sacrifice their "research integrity" for political reasons, they should be consoled by the fact that "some systematic information is better than none" (Patton 1978, p. 185).

Deciding Whether to Design Your Own Instrument or Select an Existing One

Your next task, after you have chosen your research design, is to decide whether you want to design your own instrument or select an existing one. When faced with designing an evaluation of vocational education, an evaluator may consider it best to select an existing survey instrument. This course of action does have several benefits. If the instrument has been used and fully evaluated elsewhere, items will probably be well-written and bad items eliminated or redone. Further, some instruments have published "norms," which make interpretation a bit easier.

However, existing instruments should not be blindly selected. There are no standard instruments for measuring training satisfaction and job satisfaction or any other construct. There are many well-used instruments that have severe problems, such as poorly written items or inadequate response modes. Further, while published "norms" may provide a somewhat useful comparison, there is no guarantee that the samples making up the norm are representative of the population, or are even within the same population as the sample being evaluated.

Finally, the major concern is that an existing instrument may not be appropriate to the question being asked, a particular concern within the training-satisfaction and job-satisfaction areas. There is no correct list of dimensions of training satisfaction and job satisfaction. Furthermore, the dimensions chosen from the existing instrument may not precisely tap the variable felt to be affected by vocational education. For example, satisfaction with promotion opportunity is a common dimension. However, the vocational education program may be predicted to affect satisfaction with career opportunity, and not necessarily satisfaction with promotion opportunity within one's current organization (which is more strongly affected by the availability of openings than the satisfaction with career opportunities). While the existing instrument may seem to measure the desired outcome accurately enough, even small differences such as the one pointed out here can result in inaccurate data collection.

A closely related point is that many existing measures of job satisfaction include fairly global dimensions. For example, the well-known Job Descriptive Index (JDI) has many strengths and has been valuable in many studies, but its dimensions are fairly broad. For example, does dissatisfaction with the work mean that the respondent is dissatisfied with the amount of challenge, responsibility, feeling of accomplishment, variety, and enjoyment of the activities themselves?

Summary

Unlike research studies designed primarily to add to the body of knowledge, evaluation studies are designed primarily to provide information to decision makers. Thus, no effort must be spared in increasing the probability that the evaluation information generated by a study will be used. In writing the objectives of a study, determining the respondents, and choosing the appropriate research design including the instrument, the evaluator should be guided, at all times, by the specific information needs of relevant decision makers and information users.

CHAPTER IV

MAILED QUESTIONNAIRE

The review of studies on the effects of vocational education on participants showed that the mailed questionnaire is the most popular method of data collection (Mertens et al. 1980). The reason for its popularity is obvious. It can reach respondents in widely scattered areas quickly and at a relatively low cost. However, there are serious problems associated with its use, as will be discussed later.

In this chapter, the mailed questionnaire is presented as an alternative method for collecting data that measures training and job satisfaction of former vocational students. Discussion focuses on the following topics: advantages and disadvantages of this method, and techniques for increasing the internal validity and generalizability of data collected by mailed questionnaires.

It is anticpated that most users of this handbook will be included into the following major categories: those intending to develop a new questionnaire, those intending to improve questionnaires already constructed, and those intending to adopt or adapt questionnaires developed by others. The principles and concepts discussed here will prove helpful to all groups. Readers belonging to the last two groups are encouraged to use the checklists in determining where improvements can be made on their instruments.

Some readers may be interested in examining instruments that have already been developed by states, local agencies, and research institutions. These readers may refer to *Vocational Education Measures: Instruments to Survey Former Students and Their Employers* (Gray, McKinney, and Abram 1979). Besides the instruments, the publication contains an abstract for every cited instrument along with the following information: title of instrument, developer of instrument, availability, instrument description, and administration. If the information was available, the abstract also contain data on reliability and validity.

When to Use a Mailed Questionnaire

A questionnaire is "a group of printed questions used to elicit information from respondents by means of self report" (Anderson et al. 1975, p. 311). It is the method most widely used in descriptive research because of its distinct advantages over other methods, particularly its ease in administration. However, it is not for everyone. There are serious limitations, as well as other considerations, that an evaluator must take into account before using it. The succeeding section discusses the advantages and disadvantages of mailed questionnaires.

Advantages of the Mailed Questionnaire

The mailed questionnaire offers the following advantages (Anderson et al. 1975, p. 311) over interviews in measuring the training and job satisfaction of former vocational students because they can be—

1. Administered at relatively low expense since they are completed by the respondents without need for the presence of an interviewer.
2. Distributed to respondents quickly.
3. Answered by respondents at their own pace.
4. Designed to maintain the anonymity of respondents, thus reassuring them that their answers will not be used against them in any way, thereby eliciting more honest responses than might otherwise be obtained.
5. Standardized so that all respondents receive exactly the same printed questions to answer, whereas in an interview a respondent's answer may be influenced by the way the interviewer poses the questions.

Disadvantages of the Mailed Questionnaire

Among the problems (Berdie and Anderson 1974, pp. 20–22) existent within the mail questionnaire are the following:

1. *Low response rate.* The most obvious limitation is the danger of not receiving representative response. Even with a proper sampling technique, unless a high response rate (e.g., more than 90 percent) is achieved, the study results are not representative of what the results would have been if all those who received questionnaires had responded. Kerlinger (1973 p. 414) says:

   > Responses to mail questionnaires are generally poor. Returns of less than 40 to 50 percent are common. Higher percentages are rare. At best, the researchers must content themselves with returns as low as 50 to 60 percent.

2. *Reliability and validity.* Because of the nature of the questionnaires, the effective checking of the reliability and validity of items and answers is limited.
3. *Question limitations.* The fact that written questions are sent to subjects creates certain limitations for studies using such questionnaires. Sometimes only shallow questions can be asked because increasingly complex questions incur greater chances of misinterpretation. Those who tabulate the returned questionnaires cannot always be certain that the response will be accurately interpreted during the data analysis. Those who conduct the study have no opportunity to probe deeply into answers received, thereby missing data of further value.
4. *Sample limitations.* In some studies the use of the questionnaire is not feasible. For instance, studies of samples including people who do not read must use other means of collecting information.
5. *Completers of the form.* One usually cannot be absolutely sure who has completed a returned questionnaire.
6. *Item independence.* Because some subjects read through the entire questionnaire before completing it, questions asked later in the form may influence the answers to questions at the beginning of the form.

Due to the previously stated serious drawbacks of using mailed questionnaires, noted above, some researchers refrain from using them unless other methods also are being used. The novice in questionnaire construction and administration can be especially discouraged. Kerlinger (1973, p. 414) says:

> *The mail questionnaire* . . . has serious drawbacks unless it is used in conjunction with other techniques. Two of these defects are possible lack of response and the inability to check the response given. These defects, especially the first, are serious enough to make the mail questionnaire worse than useless, except in highly sophisticated hands.

On the other hand, Dillman (1978) claims that with his Total Design Method (TDM) for mail and telephone surveys a return of 70 percent or more is not uncommon. The reader who is determined to use the mailed questionnaire should study carefully Dillman's TDM to avoid the pitfalls facing most questionnaire users. The information that follows also should be helpful.

How to Increase Confidence in Data Collected by Mailed Questionnaires

The issue of data confidence is extremely important in any data-collection method, and in research methodology it involves the question of measurement error. A self-respecting evaluator makes a primary effort to control measurement error in order to increase the "truthfulness" (reliability and validity) of the data being collected. In an effort to lessen measurement error, the following strategies are discussed in this chapter: (1) determining how many items there should be per dimension, (2) determining what questions to ask, (3) determining appropriate wording of the questions, and (4) determining appropriate response options.

Determining How Many Items per Dimension

An examination of follow-up instruments used by state and local vocational education agencies shows that information on training satisfaction and job satisfaction are either collected as unidimensional variables (i.e., one global question) or as multidimensional variables (i.e., several questions). The question, therefore, is how many items per dimension?

It is generally best to include more than one item that is intended to measure a given construct, particularly when that construct is central to the study. There are several reasons for this decision. Any one item includes some measurement error; that is, some of the variance in the responses across subjects is due to error rather than true score. If the sources of this error can be considered to be random factors (such as how wording is interpreted or how the scale's anchors are defined), then using multiple items will increase the construct validity of the score. This is true because the random errors tend to cancel each other, while the "true score" components will add up. Accordingly, it is often asserted that the reliability of a scale generally increases as items are added (assuming that they are good items).

Another reason for using multiple items is to allow for examination of the convergence among items. If two items are supposed to be measuring the same thing, then they should correlate to a reasonable degree. The exact number that is "reasonable" depends upon whether you are criticizing someone else's instrument or trying to validate one you have created.

When new items are being created to measure a construct, it is best to include at least three per construct. Even very similar items can occasionally lack convergence. If three items are used, chances are good that two will prove to be good items and converge at a satisfactory level. (Pretesting the instrument to determine convergence and requiring rework items is a good idea, of course.)

While there are advantages to multiple items, there are also disadvantages. As the scale gets longer, the marginal utility of additional items for increased reliability declines. It is often difficult to compose several items that measure the same construct without becoming redundant. Such repetition can annoy respondents, who feel that they keep answering the same question (which, in fact, is true). Additional items obviously increase the length of the instrument and may lower the response rate, cause fatigue, invalidate items near the end, and lower the number of constructs that can be measured. It is suggested that, depending on the importance of the construct to the study, there should be at least three but no more than five items per construct.

Determining What Questions to Ask

In chapter 3 you were asked to list the specific objectives of your study in measuring the training satisfaction and job satisfaction of former vocational students. These objectives should serve as your bases in determining what questions to ask. The example that follows illustrates how specific objectives are translated into specific items in the questionnaire:

Specific objective: To determine the job satisfaction of former vocational students, class 1979-80, who are employed by the industries established since 1975 in Brookings City

Item for the Questionnaire:

1. Rate the degree to which you are satisfied with the following aspects of your present job:

	Highly Satisfied (1)	(2)	Neither Satisfied nor Dissatisfied (3)	(4)	Highly Dissatisfied (5)
Salary	______	______	______	______	______
Fringe Benefits	______	______	______	______	______
Working Conditions	______	______	______	______	______
Status	______	______	______	______	______
Other (specify: ________________)	______	______	______	______	______

After all the items are written, you may want to group those that are similar or related. Your next task is to arrange your groups of items in the questionnaire so that they are presented in correct psychological order to the respondents. This will create a smooth flow of ideas for the respondents who are answering the questionnaire. They should not feel as though they are being subjected to a quiz or examination. As a rule of thumb, difficult questions are placed at the end.

Another useful procedure for determining what questions to ask is suggested by Selltiz, Wrightsman, and Cook (1976, p. 543). They say:

> An excellent test of one's performance in this stage of questionnaire construction and, at the same time, a valuable aid, is the preparation of "dummy tables" showing the relationships that are anticipated. *By drawing up such tables in advance, the investigators force themselves to definite decisions about what data are required and how they will be used* [italics added].

Before determining whether you used the proper wording, structure, and response options in your questions, take a few minutes to think about the questions posed in checklist 5. It is worth your time to move ahead cautiously. Remember, the most troublesome errors in questionnaires "creep in unwittingly, even in 'obviously simple questions' " (Selltiz, Wrightsman, and Cook 1976, p. 547).

Determining Appropriate Wording of the Question

After decisions have been made regarding the questions to ask, you are ready to address one of the most important, as well as the most difficult, tasks in the entire phase of the study—writing a good questionnaire item. "The formulation of good questions is much more subtle and frustrating than is generally believed by those who have not actually attempted it" (Goode and Hatt 1962, p. 132). Many experts believe that the most important defect of commercial survey research is improperly worded questions.

In regard to question wording, two important, separate decisions must be made: deciding question structure and deciding actual choice of words. Dillman (1978, p. 86) identifies four basic types of question structure according to the nature of response behavior asked of the respondents: open-ended, close-ended with ordered choices, close-ended with unordered choices, and partially close-ended. Table 2 explains the uses, the advantages, and the disadvantages of these four types of question structure.

The type of question structure to use depends on the kind of information the evaluator is attempting to obtain in the survey. Selecting the wrong structure may mean getting the wrong information and receiving answers to the wrong evaluation questions. Additionally, the evaluator should consider other factors such as staff expertise, time available for the study, and financial resources. Analysis of results of certain structures, such as the open-ended structure, demands considerable expense money, a lot of time, and a high degree of expertise (Jacobs 1974, p. 10).

Whichever structure is used, the key issue is to maximize the specificity of the item. The object being referred to should be concise and clear, particularly when the effects of vocational education are being evaluated. As argued in the preceding section, any effects are likely to be very specific and will not be identified by one global satisfaction question.

After a decision is made on question structure, the evaluator needs to decide on the actual choice of words. "The wrong choice of words can create any number of problems—from excessive vagueness to too much precision, from being misunderstood . . . from being too objectionable to being too uninteresting and irrelevant" (Dillman 1978, p. 95). Payne (1951, p. 9) adds:

> Question wording invovles more than toying with this word or that to see what may happen, however. It is more than a mere matter of manipulation of words to produce surprising illusions. The most critical need for attention

CHECKLIST 5

Decisions About Question Content

Instructions: Examine each question in your questionnaire in terms of the following points:

Yes	*No*	
☐	☐	1 Is this question necessary? Just how will it be useful?
☐	☐	2. Are several questions needed on the subject matter of this question?
☐	☐	3. Do the respondents have the information necessary to answer the question?
☐	☐	4. Is the question concrete, specific, and closely related to the respondent's personal experience?
☐	☐	5. Is the question content sufficiently general and free from too much concreteness and specificity?
☐	☐	6. Is the question content biased or loaded in one direction without accompanying questions to balance the emphasis?
☐	☐	7. Will the respondents give the information that is asked for?

Note: Ideas in this checklist were taken from C. Selltiz, L.S. Wrightsman, and S.W. Cook, *Research Methods in Social Relations* (New York, New York: Holt, Rinehart and Winston, 1976).

TABLE 2

Types of Question Structure

1. Open-ended Questions

Examples

- In your opinion, what is the most satisfying part of your vocational training?
- What specific things about this vocational program have you found to be least useful to you in your present job?

Advantages

- Lend themselves to situations in which respondents can express themselves freely and/or recall a precise piece of information without difficulty.
- Are useful when researchers cannot anticipate the various ways in which people are likely to respond to a question.
- Tend to stimulate free thought, be suggestive, probe people's memories, and clarify positions.

Disadvantages

- Can be very demanding. The tasks of articulating answers is difficult for most respondents, especially for those with low educational attainment and for those who lack experience in communicating ideas to other people.
- Are time-consuming for the respondents and may affect the response rate.
- Elicit answers difficult to code and summarize.

2. Close-ended Questions with Ordered Answer Choices

Example

- Considering your vocational training, rate the degree to which you are satisfied with each of the following:

	Satisfied	*Not Sure*	*Dissatisfied*
Methods of instruction	☐	☐	☐
Facilities and equipment	☐	☐	☐
Guidance service	☐	☐	☐
Placement services	☐	☐	☐
Cooperative work experience	☐	☐	☐
Apprenticeship training	☐	☐	☐

Advantages

- Are suitable for determining such things as intensity of feeling, degree of involvement, and frequency of participation.
- Elicit responses suited to many forms of statistical analyses.
- Place little demand on respondents.

Disadvantages

- Tend to be very specific, causing respondents to think about a limited aspect of life in a limited way. Having a response dimension narrow in scope enables respondents to place themselves at the most appropriate point on a scale implied by the answer choices. Only appropriate if the researcher has a well-defined issue.

Table 2 (continued)

3. Close-ended Questions with Unordered Answer Choices	
Example	• Which one of the following aspects of your vocational training are you most satisfied with? (Check one) ☐ Methods of instruction ☐ Facilities and equipment ☐ Guidance service ☐ Placement services ☐ Cooperative work experience ☐ Apprenticeship training
Advantages	• Are useful for establishing priorities among issues and deciding among alternative policies. • Do not limit respondents to choosing among gradations of a single concept. Each choice is an independent alternative representing a different concept.
Disadvantages	• Are generally more difficult to answer than those containing ordered answer choices, inasmuch as respondents must often balance several ideas in their minds at the same time. • Preclude obtaining useful results unless the researcher's knowledge of the subject allows meaningful choices to be stated; possibly eliminates the most preferable option of the respondents.
4. Partially Close-ended Questions	
Example	• Which one of the following aspects of your vocational training are you most satisfied with? (Check one) ☐ Methods of instruction ☐ Facilities and equipment ☐ Guidance service ☐ Placement services ☐ Cooperative work experience ☐ Apprenticeship training ☐ Other (specify: ______________________________)
Advantages	• Allow building of variables and testing of hypotheses. • Preclude forcing respondents into boxes in which they clearly do not fit.
Disadvantages	• Seldom obtain sufficient number of additional responses in the open-ended option.

Note: In making this table, some ideas were taken from D. Dillman, *Mail and Telephone Surveys: The Total Design Method* (New York, New York: John Wiley & Sons, 1979).

> to wording is to make sure that the particular *issue* which the questionnaire has in mind is the particular issue on which the respondent gives his answers . . .
>
> To assure that the intended issue is understood, then, is the fundamental function of question wording.

The goal, then, is to word carefully and clearly each question so that all respondents interpret it in the same manner as the question designers. "Generally, the most effective questions are worded as simply as possible" (Berdie and Anderson 1974, p. 39). Table 3 shows some "don'ts" in question wording. Checklist 6 is designed to help you determine appropriate question wording.

Determining Appropriate Response Options

A well-constructed questionnaire includes both proper wording of questions and proper response options. Confusing options increase measurement error (unreliable results) and the percentage of nonresponse rate. The following suggestions (Berdie and Anderson 1974, pp. 45–47) and examples are offered to help you design appropriate response options for questionnaire items.

1. Make certain that one response category is listed for every conceivable answer. To omit an option forces people to answer in a way that does not accurately reflect reality.

   Example: In your opinion, what is the most satisfying part of your present job? (check one)

Poor Options (very few choices)	*Better Options* (more choices)
______ Salary	______ Salary
______ Fringe benefits	______ Fringe benefits
	______ Working conditions
	______ Coworkers
	______ Others (please specify: ____________)

2. Include a "don't know" response option whenever respondents may be unable to answer. Although a "don't know" option may be viewed as offering respondents an "easy out," it is probably better to include this option than to take the chance of obtaining inaccurate information by forcing people to respond to an item about which they know nothing.

   Example: In your opinion, what aspect of your vocational training needs the most improvement? (check one)

Poor Options	*Better Options*
______ Facilities and equipment	______ Facilities and equipment
______ Teachers	______ Teachers
______ Apprenticeships/coop	______ Apprenticeships/coop
	______ Others (please specify: ____________)
	______ Don't know

TABLE 3

Some Don'ts in Question Wording

Ambiguity	- Avoid questions that are incomplete, imprecise, or indefinite.
	- An incomplete question is likely to lead to confusion.
	- An imprecise question conveys an unreal meaning or suggests an inaccurate answer.
	- An indefinite question contains hazy words—e.g., "frequently," "usually," "often," "always," etc.
Misperception	- Avoid questions containing words that lie outside the respondents' experiences and have no meaning to them.
	- Avoid questions containing words so familiar to respondents that they may be confused with similar-sounding words.
	- Avoid questions that violate local idioms. When a question is worded contrary to expectations, respondents are likely to respond, nonetheless, in terms of their expectations.
Loading	- A question is loaded when something in it suggests to the respondents that one particular response is more desirable than another.
	- A question is loaded when it provides unfair alternatives.
	- A question is loaded when it contains emotionally charged words or stereotypes.
	- A question is loaded when it is embarrassing.
Special Wording Problems	- Avoid questions that assume too much knowledge on the part of the respondents.
	- Avoid lengthy questions, such as two-part questions.
	- Avoid use of double negatives.
	- Avoid illogical sentence construction.

Note: Ideas in this table were taken from C. H. Backstrom and G. D. Hursh, *Survey Research* (Northwestern University Press, Chicago, Illinois, 1964).

CHECKLIST 6

Decisions About Question Wording

Instructions: Examine each question carefully in your questionnaire in terms of the following points:

Yes	*No*	
☐	☐	1. Can the question be misunderstood?
☐	☐	2. Does it contain unfamiliar or unclear phrases?
☐	☐	3. Does the question adequately express the alternatives with respect to the point?
☐	☐	4. Is the question misleading because of unstated assumptions or unseen implications?
☐	☐	5. Is the wording biased?
☐	☐	6. Is it emotionally loaded or slanted toward a particular kind of answer?
☐	☐	7. Is the question wording likely to be objectionable to the respondent in any way?
☐	☐	8. Would a more personalized or less personalized wording of the question produce better results?
☐	☐	9. Can the question be better asked in a more direct or a more indirect form?

Note: Ideas in making this checklist were taken from C. Selltiz, L. S. Wrightsman, and S. W. Cook, *Research Methods in Social Relations.* (New York, New York: Holt, Rinehart and Winston, 1976).

3. **Make response options mutually exclusive and independent.**

Example: In your opinion, what is the most satisfying part of your present job? (check one)

Poor Options (options not mutually exclusive)	*Better Options* (options mutually exclusive)
______ Salary	______ Salary
______ Medical benefits	______ Medical benefits
______ Fringe benefits	______ Other fringe benefits
______ Working conditions	______ Working conditions
______ Status	______ Status
	______ Others (please specify: ______________)

4. Balance all scales used in the response options. Include an equal number and degree of options on each side of a middle position.

Example: Please rate the degree to which you are satisfied with the following:

Poor Scale (unequal number of options on each side of the middle position)

	Satisfied (1)	Neither Satisfied nor Dissatisfied (2)	Dissatisfied (3)	Highly Dissatisfied (4)
Salary	______	______	______	______
Fringe benefits	______	______	______	______
Working conditions	______	______	______	______
Status	______	______	______	______
Others (please specify: ________________)	______	______	______	______

Better Scale (equal number of options on each side of the middle position)

	Highly Satisfied (1)	Satisfied (2)	Neither Satisfied nor Dissatisfied (3)	Dissatisfied (4)	Highly Dissatisfied (5)
Salary	______	______	______	______	______
Fringe benefits	______	______	______	______	______
Working conditions	______	______	______	______	______
Status	______	______	______	______	______
Others (please specify: ________________)	______	______	______	______	______

5. Make sure to label the midpoint according to the "exact" meaning the scales require.

   Example: Please rate the degree to which you are satisfied with the following:

   Poor Scale (midpoint not labeled)

	Highly Satisfied (1)	Satisfied (2)	(3)	Dissatisfied (4)	Highly Dissatisfied (5)
Salary	______	______	______	______	______
Fringe benefits	______	______	______	______	______
Working conditions	______	______	______	______	______
Status	______	______	______	______	______
Others (please specify: ______________)	______	______	______	______	______

   Better Scale (midpoint labeled according to the exact meaning):

	Highly Satisfied (1)	Satisfied (2)	Neither Satisfied nor Dissatisfied (3)	Dissatisfied (4)	Highly Dissatisfied (5)
Salary	______	______	______	______	______
Fringe benefits	______	______	______	______	______
Working conditions	______	______	______	______	______
Status	______	______	______	______	______
Others (please specify: ______________)	______	______	______	______	______

6. Arrange responses vertically.

   Example: In your opinion, what aspects of your vocational training needs the most improvement? (check one)

   Poor Response Arrangement (horizontally arranged)

Facilities and equipment	______	Teachers	______
Apprenticeships/coop	______	Others	______
Don't know	______		

   Better Response Arrangement (vertically arranged)

   ______ Facilities and equipment
   ______ Teachers
   ______ Apprenticeships/coop
   ______ Others
   ______ Don't know

7. Make certain the respondents know exactly what information they should put in the blanks of fill-in-the-blank items.

Poor Direction:	*Better Direction:*
______ Age in years	______ years of age at last birthday

Now you are probably ready to write your response options. After you have written them and before you begin to read the next section, take a few moments to review your response options by following the instructions in checklist 7.

Pretesting

The reader is forewarned that good question construction requires a deliberate process entailing considerable investment of time and material resources. It can be a frustrating process for evaluators, especially if they need to meet short deadlines. Oftentimes, it involves pretesting to reveal the questionnaire's weaknesses. Lundberg (1942, p. 198) warns:

> The inexperienced researcher is likely to be impatient with this preliminary work, which may seem like hair splitting over the meaning of words, and other details. But patience and care in this preliminary work may make all the difference between success or failure, both in the cooperation of the respondents and in the reliability and validity of the results.

Pretesting can be informal or formal. The most important aspect of the exercise is to pretest the questionnaire with respondents representative of the group of former vocational students who will eventually receive it. If the evaluator desires, pretesting can generate data that will reveal the readability, reliability, and validity of the instrument. (For additional discussion on the subject, see Franchak and Spirer 1978 and McCaslin and Walker 1979.)

How to Increase the Generalizability of Data Collected by Mailed Questionnaires

As mentioned earlier, one of the most serious problems of using the mailed questionnaire is low response rate. Partial returns "may introduce bias that will render the obtained data useless" (Van Dalen 1973, p. 325). Inadequate response is especially critical if questionnaires have been sent to a sample, because the resulting summarized data may not represent the true response of all the target respondents. As a result, generalizability of the data collected and their usefulness for decision making and program improvement are impaired.

This section details some valuable strategies for increasing the response rate of mailed questionnaires. Strategies are focused on preventive tactics; that is, the removal of possible causes within the evaluator's control that prevent the respondents from answering and returning the questionnaires. Included are proper format considerations and other strategies for stimulating response.

Format Considerations

Proper formulation of the instrument is a critical phase of questionnaire development. Improper format not only creates problems for data coders and tabulators, but can also lead to misinterpretation

CHECKLIST 7

Deciding about Response Options

Instructions: Respond to the following questions as appropriate:

1. What type of response options are present in your mailed questionnaire?

   1. ______________________________
   2. ______________________________
   3. ______________________________
   4. ______________________________

2. If a checklist is used,

   1. Does it cover adequately all the significant alternatives without overlapping? ☐ Yes ☐ No
   2. Is it of reasonable length? ☐ Yes ☐ No
   3. Is the wording of items impartial and balanced? ☐ Yes ☐ No

3. Is the form of response –

   1. Easy? ☐ Yes ☐ No
   2. Definite? ☐ Yes ☐ No
   3. Uniform? ☐ Yes ☐ No
   4. Adequate for the purpose? ☐ Yes ☐ No

of questions (thus increasing measurement error) and low response rates (thus weakening the generalizability of results). Careful consideration must be given to two areas when format decisions are made:

1. *The respondents (former vocational education students).* The format should enable them to read and answer questions as easily as possible. Keep in mind that completing a questionnaire is an imposition.
2. *Data coders and tabulators.* The format should allow easy data coding and tabulation.

Goode and Hatt (1962, p. 43) succinctly summarize the important principles to observe in formulating a questionnaire:

> Common sense dictates certain practices about the design of the mail questionnaire. The mail questionnaire should be attractive and easy to fill out, have adequate space for response, and be legible. A neat, well-organized, attractive questionnaire should increase the response rate. This assumes that people associate appearance with quality and are more willing to complete and return the form. Conversely, a sloppy, crowded, or poorly reproduced questionnaire will have adverse effect on response rates.

Checklist 8 will help you review and improve the format of your mail questionnaire.

Strategies to Stimulate Response

Following up nonrespondents is a difficult and costly process. It is, therefore, important to exhaust all means to keep the percentage of nonresponse as low as possible. The emphasis should be on preventive tactics, i.e., the employment of strategies prior to the receipt of the questionnaire by the respondents.

Do you know your respondents? Have you anticipated all conceivable objections to their answering and returning the questionnaire? These questions are crucial in devising specific strategies to stimulate response. Your tactics should be tailored to your specific respondents, former vocational students, and should include techniques appropriate for this particular group.

> The ultimate objective is to obtain as many responses as possible, in the form of completed questionnaires, which provide usable data. If questionnaire forms meet criteria of physical attractiveness and obvious consideration for the respondent, it is believed that the percentage of replies will be sufficiently high to fulfill the requirements of the investigator. Every conceivable inducement should be used in the hope of convincing one more potential respondent to take the time and effort necessary to answer the questionnaire (Nixon 1954, p. 486).

Inducement for the respondents to reply can include making precontact either by telephone or mail, preferably by someone who is known by the respondents (e.g., former vocational teachers or guidance counselors). In addition, the evaluator may use material or monetary inducements such as sending cash or small gift items such as pencils, school decals, or buttons, or evaluators could use a raffle as an inducement with the respondents included in a raffle if they return their questionnaires. Some social researchers find that such inducements do increase significantly the rate of response.

Another strategy for increasing response rate is to start an early campaign to inform your target population. Some local schools begin their information drive while the students are in their

CHECKLIST 8

Format Considerations

Instructions: Examine your questionnaire format in terms of the following considerations:

Yes	*No*	
☐	☐	1. Is the questionnaire "appealing to the eye" and as easy to complete as possible?
☐	☐	2. Did you number questionnaire items and pages so the respondent will not become confused while completing the form?
☐	☐	3. Did you put an identifying mark on each page of the form so that if one page should get separated from the rest, it can be reattached?
☐	☐	4. Did you put the name and address of the person to whom the form should be returned at the beginning and end of the questionnaire even if you included a self-addressed envelope, since questionnaires are often separated from the cover letter and the envelope?
☐	☐	5. Did you put the study title in bold type on the first page of the questionnaire?
☐	☐	6. Did you include brief and clear instructions (preferably bold or italics) for completing the form and additional clarification and examples before sections that may be confusing?
☐	☐	7. Is the question led up to in a natural way, i.e., is it in correct psychological order?
☐	☐	8. Did you begin with a few interesting nonthreatening questions because introductory questions that are either threatening or dull may reduce the likelihood of the subject's completing the questionnaire?
☐	☐	9. Did you avoid putting important items at the end of a long questionnaire?
☐	☐	10. If questions appear on both sides of the page, did you put the word "over" on the bottom of the front side of that page?
☐	☐	11. Did you try to make smooth transition between sections so that the respondent does not feel he is answering a series of unrelated "quiz" questions?

Note: Ideas in this checklist were taken from Douglas R. Berdie and John F. Anderson, *Questionnaire: Design and Use* (Metuchen, N.J.: The Scarecrow Press, Inc., 1974) and C. Selltiz, L. S. Wrightsman, and S. W. Cook, *Research Methods in Social Relations* (New York, New York: Holt, Rinehart, and Winston, 1976).

senior year. They are made aware of the objectives and importance of the study and their role in it. So before graduating, the students know already that they will be participating in a follow-up study.

Now, let us pause and take a hard look at your completed questionnaire. Checklist 9 is designed to help you review the strategies that you have selected to stimulate response. Remember, "An ounce of prevention is better than a pound of cure."

Dealing with Nonresponse Bias

If only a certain percentage of your sample completed and returned the questionnaires, would the summarized response reflect the entire sample? Your answer may be yes, or no. There is no simple and easy answer to this question.

> Questionnaire users must consider the response rate problem as it uniquely applies to their own situation. Careful consideration of the situation should dictate whether or not [nonresponse] bias is a danger and, if so, what decisions must be made about the percentage of response needed to [ensure] representativeness and what should be done with the data if this level of response is not reached (Berdie and Anderson 1974, p. 51).

The following strategies (see also Franchak and Spirer 1978) may help you deal with the problem of nonresponse bias:

1. *Compare the respondents and nonrespondents on certain variables.* If the two groups are similar perhaps you may ignore the nonresponse issue. However, keep in mind that comparing respondents to nonrespondents only on demographic data may not be relevant to the response rate problem. You are concerned with attitudinal data, and "the fact that nonrespondents may or may not share certain demographic features with . . . respondents often says very little as to whether or not they share similar attitudes" (Berdie and Anderson 1974, p. 50).

2. *Get a random sample of nonrespondents and follow up this sample.* Consider the responses of this sample as the responses of all nonrespondents. This is considered a better alternative than the first one; however, the problem is that some may not respond at all.

At this point another word of caution is in order. You may be tempted to increase your sample size to offset nonresponse. For example, instead of sending questionnaires to a random sample of 100 as originally designed, questionnaires may be sent to a random sample of 120 former vocational students. If the return rate is 80 percent, you will receive 96 completed returns, which is close to 100. While in some cases, increasing the sample size may serve a useful purpose, it does not solve the response rate problem, which is the percentage of respondents. It is of extreme importance that the evaluator place emphasis on *increasing the response rate,* not the sample size.

Summary

While the mailed questionnaire is the most popular method of collecting data, it is fraught with serious limitations (see figure 3). Low response rate and the difficulty of checking the accuracy of the responses are the two most important problems. To ensure greater confidence in the data collected by mailed questionnaire and also better generalizability of the data, certain methodological controls and strategies need to be instituted by the evaluator. Figure 4 illustrates some techniques for decreasing measurement error, and figure 5 shows some techniques for increasing generalizability.

CHECKLIST 9

Stimulating Response

Instructions: Take time to review your strategies to stimulate response by answering the following questions:

1. How will you relate (i.e., formally or informally) to your sample of former vocational students?

____

____

2. How will you be able to guarantee respondent's anonymity or confidentiality?

____

____

3. Will your correspondence and questionnaire be printed in the most professional and appealing manner? ☐ Yes ☐ No

4. Have you carefully considered the content and approach of your preletter and cover letter? ☐ Yes ☐ No

5. Have you considered offering some type of incentive (such as giving the respondent small cash or gift items) to encourage responses? ☐ Yes ☐ No

6. Have you identified sufficient resources from which to obtain updated addresses of people in your study? ☐ Yes ☐ No

7. Where is the best place to send the questionnaire to the respondents? ☐ work? ☐ home? ☐ both work and home?

8. Have you considered using "high-powered" mailing tactics (such as the use of special delivery, certified, or first class mail) to stimulate responses? ☐ Yes ☐ No

9. What methods will you employ to determine why people are not returning completed ques-questionnaires?

____

____

10. Have you allocated sufficient resources to follow-up nonrespondents? ☐ Yes ☐ No

Checklist 9 (continued)

11. What method have you considered using for follow-ups?

____

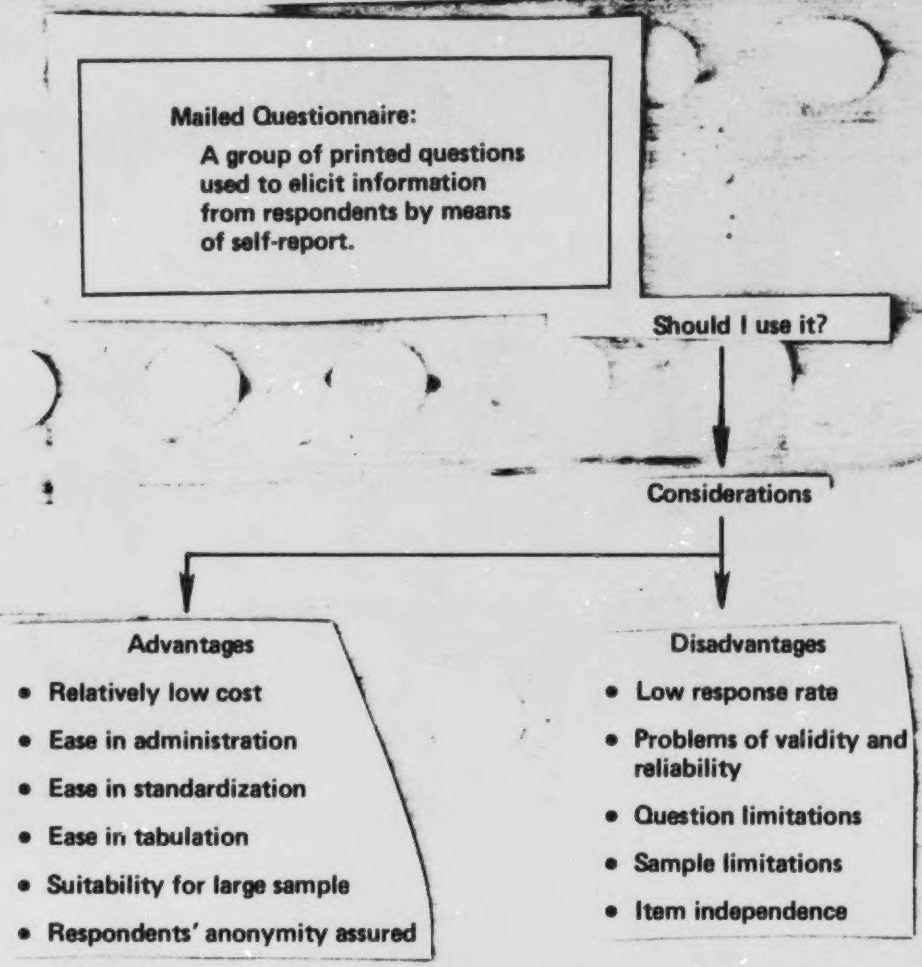
____

12. Will your follow-ups be: ☐ humorous? ☐ serious? ☐ combination of both?

Note: Some ideas in making this checklist were taken from Douglas R. Berdie and John F. Anderson, *Questionnaires: Design and Use* (Metuchen, N.J., The Scarecrow Press, Inc., 1974).

FIGURE 3

Mailed Questionnaire:
Advantages and Disadvantages



Mailed Questionnaire:
A group of printed questions used to elicit information from respondents by means of self-report.

Advantages

- Relatively low cost
- Ease in administration
- Ease in standardization
- Ease in tabulation
- Suitability for large sample
- Respondents' anonymity assured

Disadvantages

- Low response rate
- Problems of validity and reliability
- Question limitations
- Sample limitations
- Item independence

FIGURE 4

Decreasing Measurement Error
of Mailed Questionnaire

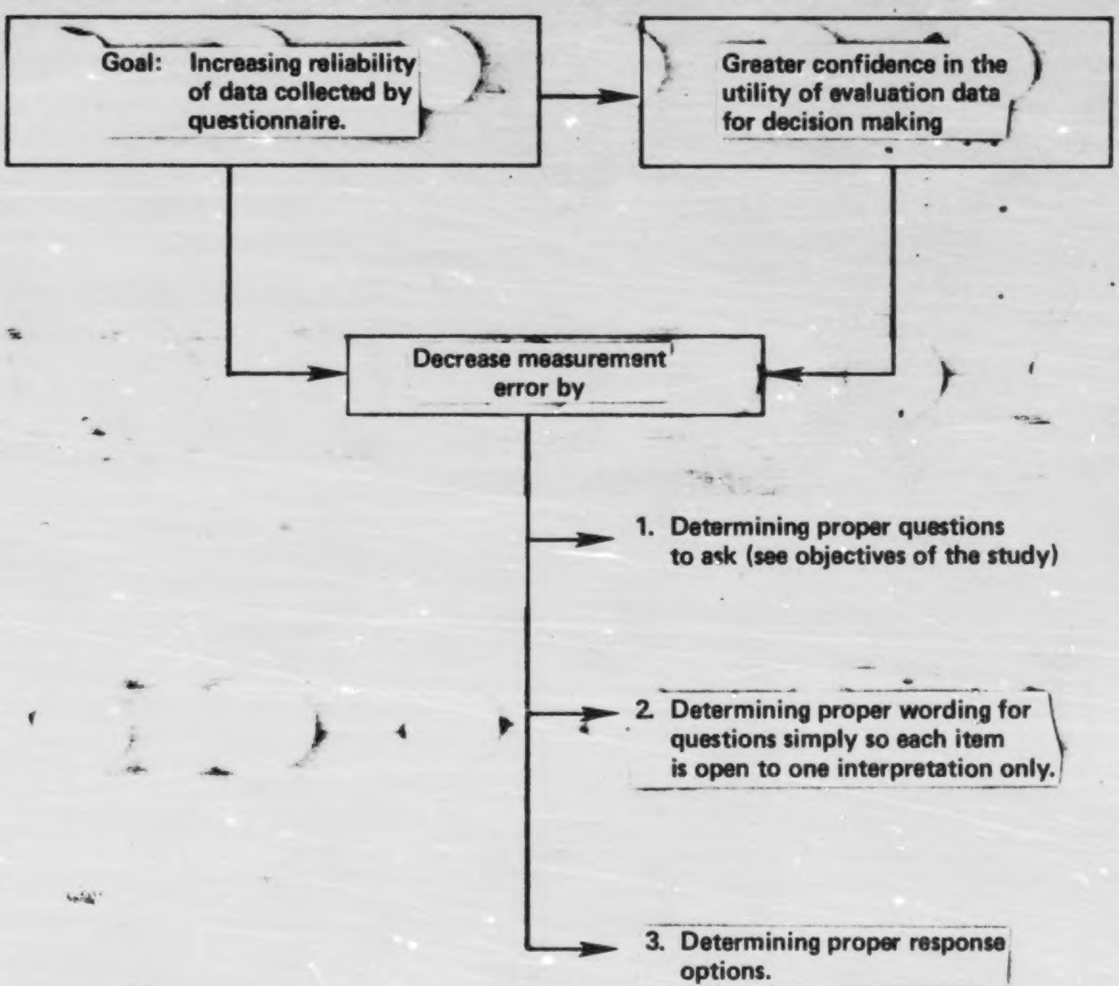
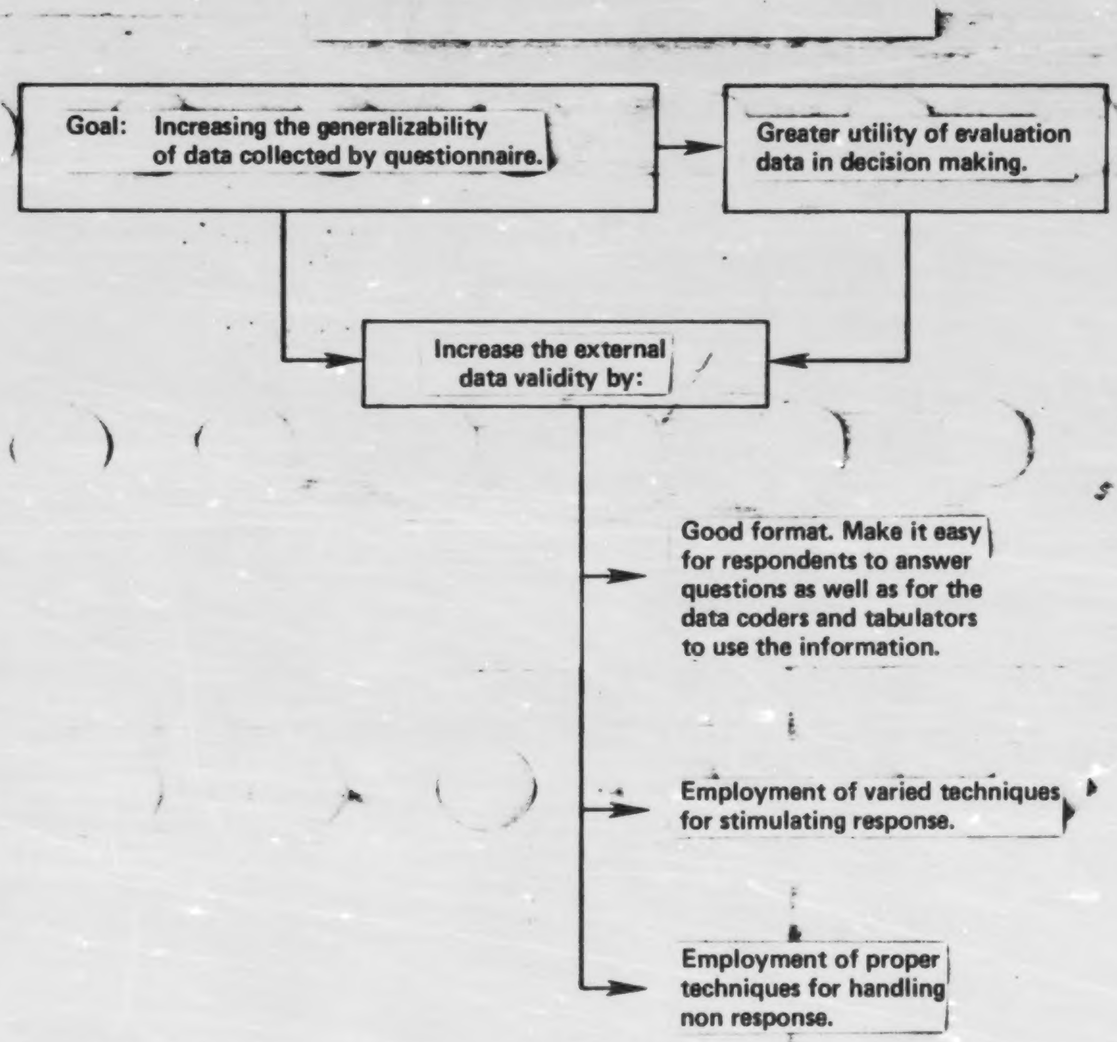

Goal: Increasing reliability of data collected by questionnaire.
Greater confidence in the utility of evaluation data for decision making
Decrease measurement error by
1. Determining proper questions to ask (see objectives of the study)
2. Determining proper wording for questions simply so each item is open to one interpretation only.
3. Determining proper response options.

FIGURE 5

Increasing Data Generalizability
of Mailed Questionnaire


Goal: Increasing the generalizability of data collected by questionnaire.
Greater utility of evaluation data in decision making.
Increase the external data validity by:
Good format. Make it easy for respondents to answer questions as well as for the data coders and tabulators to use the information.
Employment of varied techniques for stimulating response.
Employment of proper techniques for handling non response.

CHAPTER V

INTERVIEWING

In addition to the use of the mailed questionnaire, interviewing is a common form of collecting data employed in survey research. Data are collected by talking with people, but interviewing entails more than asking questions of people (Kester 1979, p. 32). While asking questions is a natural part of the process, interviewing requires specialized skills and precise procedures to ensure full and accurate data collection (Institute for Social Research 1976, p. 1). Thorough and careful planning is required. As in the use of the questionnaire, there is a need for instituting proper methodological control to ensure a high degree of data confidence and generalizability.

This chapter explains the use of the interview as an alternative method for collecting data to measure training and job satisfaction of former vocational students. The concepts discussed complement those cited in another National Center publication, *The Case Study Method: Guidelines and Practices for Vocational Education* (Spirer 1980). The chapter focuses on topics that have direct bearing on the issues of internal data validity and generalizability. Specifically, the topics that are discussed are (1) selection of the interview and a data collection method, (2) strategies for increasing internal validity of confidence in the data, and (3) strategies for increasing the generalizability of interview data.

When to Use the Interview

Before the interview is selected as a data collection method, careful consideration should be made as to its strengths and weaknesses in relation to the evaluation goals, the population to be surveyed, and the precise survey objectives. The following listing itemizes common advantages and disadvantages (Anderson et al. 1975, p. 216) of using the interview instead of the mail questionnaire:

Advantages:

1. Does not require reading or writing by respondent
2. Is adaptable to unforeseen circumstances
3. Provides an opportunity to obtain a representative sample of respondents
4. Permits study of complex and sensitive topics
5. Ensures that respondents understand questions
6. Permits the respondent's environment to be structured to some degree

Disadvantages:

1. Requires trained interviewers
2. Is subject to variable and unpredictable interviewer bias
3. Tends to be difficult to structure because of large response volume
4. High cost involved

Perhaps the most important drawback in using the interview as a data collection method is the cost, especially for face-to-face interviews. However, for certain respondents, such as special population groups, it may be the most feasible method. For example, it may be unwise to use the questionnaire in collecting data from individuals who may have difficulty reading and understanding written questions, and writing responses. In this situation, an interview may be more appropriate.

If you decide to use the interview, another decision involves the specific type to use. Many other factors, such as obtaining a representative sample, deciding on questionnaire design, obtaining accurate answers, and fulfilling administrative requirements need to be considered (Dillman 1978, pp. 74-75). In the above example, it may be appropriate to use a face-to-face interview if the sample is located in a specific geographical area such as a town. If the sample is distributed throughout the United States, the use of the telephone interview may be more appropriate. Checklist 10 is designed to help you make a proper choice in selecting the type of interview to employ in measuring the training and job satisfaction of former vocational students.

How to Increase Confidence in the Data Collected by Interview

As emphasized in the previous chapter, exercising methodological control for reducing measurement error should be a continuing, important concern for both the evaluator and the researcher. Data reliability—a major determinant of data usability—is very much a function of methodological rigor. Additionally, when the interview schedule is finalized, much investment (time and money) has been made on the study. Thus, no effort must be spared in ensuring that complete, *accurate data* are collected. Preliminary computer processing and data analysis for initial results can be undertaken to detect certain errors. These preliminary efforts may minimize the study cost and time of the study.

In using the interview, the evaluator needs to pay particular attention to measurement error from two vantage points: question construction and interviewing process. The principles and techniques discussed in the previous chapter regarding determination of question content, structure, and wording apply also in formulating questions for the interview. Although interviewers have greater flexibility in asking questions than the mailed questionnaire—e.g., use of open-ended questions or use of probes—the basic principles of question construction and the factors to consider in making decisions remain the same. Questions should be clear and unbiased with each one focused on a single thought or issue. To the extent possible, the language and syntax of the questions should correspond to that of the respondent.

On the other hand, the best constructed questions will not be of much value in collecting valid and useful data when posed by unskilled or biased interviewers. Though many hours may have been spent in perfecting the interview questions, in the final analysis the utility and effectiveness of a questionnaire in getting valid and useful information depend upon the interviewer. The following subsection details some strategies and techniques for reducing data distortion during the interviewing process and includes some useful techniques for probing answers.

Using the Questionnaire in Interviewing

Collection of accurate and useful information is the goal in using the *interview schedule,* which is the interviewer's guide in posing the questions to the respondents. It should be impressed upon interviewers that "each question has been carefully pretested to express the precise meaning desired

CHECKLIST 10

Deciding the Type of Interview to Use

Instructions: The evaluator should not be confined to one data collection methodology, but should be able to select the most appropriate methodology demanded by the situation. Take a few minutes to answer each of the items listed below:

Type of Respondents	*Number Respondents*	*Geographical Distribution*	*Method Selected (check one item)*	
			Face-to-Face	Telephone
1. Regular student	______	______	☐	☐
2. Women	______	______	☐	☐
3. Handicapped	______	______	☐	☐
4. Disadvantaged	______	______	☐	☐
5. Minority	______	______	☐	☐
6. Limited-English Proficiency	______	______	☐	☐
7. Returning Adults	______	______	☐	☐
8. Others (specify:)	______	______	☐	☐

____

in as simple a manner as possible—even a slight rewording of the question can so change the stimulus as to provoke answers in a different frame of reference or bias the response" (Selltiz, Wrightsman, and Cook 1976, p. 564). To this effect, Backstrom and Hursh (1963, p. 139) offer the following suggestions:

1. Always follow instructions carefully.
2. Always study the questionnaire until you are familiar with all the questions.
3. Always use the brief introductory approach written into the questionnaire.
4. Always be completely neutral, informal, conscientious.
5. Always read questions just as they are written.
6. Always ask all of the questions.
7. Always ask questions in the order they appear.
8. Always record comments accurately.
9. Always interview only the proper person . . . designated by your procedure.
10. Always check each questionnaire to make sure you have completed every item.
11. Always interview people you don't know, and interview them alone.

However, Dexter (1979, p. 23) cautions that there is no set of universal rules that govern all situations in interviewing. In the ultimate analysis, "every suggestion about how to conduct interviews must depend upon these all-important variables: the personality and skill of the interviewer, the attitudes and orientation of the interviewee, and the definition by both (and often by significant others) of the situation" (Dexter 1979, p. 24).

Probing and Other Interviewing Techniques

It is relatively easy for interviewers to ask questions and record answers. However, obtaining a specific, complete response, which is crucial to the interviewing process, requires skill. It is not uncommon for some respondents to answer "Don't know" in order to avoid thinking about a question, misinterpreting the question, or contradicting themselves. In all these critical cases, the interviewer can use probing techniques.

Probing is a technique that motivates respondents to communicate fully so that they enlarge on, clarify, or explain the reasons behind what they have said. At the same time, it helps the respondents focus on the specific content of the interview so that irrelevant and unnecessary information can be avoided (Institute for Social Research 1976, p. 15). A good interviewer, therefore, is alert in detecting incomplete or vague answers and skillfully uses neutral probes to elicit complete, specific information from the respondents. This technique requires the interviewers to understand the objective of every question. It is only through "complete understanding of the question that the interviewer can recognize when and where probes are needed and use them effectively" (Institute for Social Research 1976, p. 16). Toward this end, several useful techniques for probing (Institute for Social Research 1976, pp. 15-16) are suggested:

1. *Repeating the question.* When respondents do not seem to understand the question, when they misinterpret it, when they seem unable to make up their minds, or when they stray from the subject, the most useful technique is to repeat the question just as it is written in the questionnaire.

2. *Using an expectant pause.* The simplest way to convey to respondents that you know they have begun to answer the question, but that you feel they have more to say, is to be silent. The pause—often accompanied by an expectant look or a nod of the head—gives the respondents time to gather their thoughts.

3. *Repeating the respondent's reply.* Simply repeating what the respondents have said as soon as they have stopped talking is often an excellent probe. This repetition should be made as you are writing, so that you are actually repeating the respondents' reply and recording it at the same time. Be sure also that you are understood correctly.

4. *Using neutral questions or comments.* Neutral questions or comments are frequently used to obtain clearer and fuller responses. The following are the most commonly used probes:
   - Let me repeat the question.
   - Anything else?
   - Any other reason?
   - Any others?
   - What do you mean?
   - Could you tell me more about your thinking on that?
   - Would you tell me what you have in mind?
   - Why do you feel that way?
   - Which would be closer to the way you feel?

5. *Asking further clarification.* In probing, you will sometimes find it useful to appear slightly bewildered by the respondents' answers. For example: "I'm not quite sure I know what you mean by that—could you tell me a little more?" This technique, however, should not be overplayed.

Dealing with Interviewer's Bias

Interviewer's bias—"systematic differences from interviewer to interviewer or, occasionally, systematic errors on the part of many or even all interviewers"—affects the validity of evaluation data collected through interview (Selltiz, Wrightsman, and Cook 1976, p. 570). Personality and demographic characteristics of the interviewers and situational factors may influence the responses of the respondents (Van Dalen 1973, pp. 329-330). Thus different interviewers will not always elicit the same response even from equivalent groups of respondents. Interviewer's bias is, therefore, a reality of which every evaluator needs to be aware. The most common techniques for reducing interviewer's bias include the following:

1. *Proper selection of interviewers.* Common sources of bias sources are the interviewers' preconceived ideas or perceptions of the situation. If the result of the survey is a possible threat to the interviewers in any way, e.g., posing a threat to personal interests or beliefs, interviewers are likely to introduce bias (Selltiz, Wrightsman, and Cook 1976, p. 572). A good evaluator should take into account the foregoing consideration when selecting interviewers. Now take a few minutes of your time to complete checklist 11 to help you in the selection of interviewers.

2. *Standardization of the interview.* This procedure includes use of standard wording in interview questions and standard instructions on probing procedure, classification of doubtful answers—suggestions all aimed at minimizing interviewer's bias.

CHECKLIST 11

Selection of Interviewers

Instruction: Please respond to the following questions:

1. How many interviewers do you need? ______

2. What special qualifications are required? Please list them.

   1. ________________________________
   2. ________________________________
   3. ________________________________
   4. ________________________________
   5. ________________________________

3. What personal characteristics are required? Please list them.

   1. ________________________________
   2. ________________________________
   3. ________________________________
   4. ________________________________
   5. ________________________________

3. *Appropriate training of interviewers.* Untrained or improperly trained interviewers are certain to manifest greater bias than those adequately trained. The training procedure should include the following experiences: how to make initial contact, how to secure the interview, how to use the questionnaire, how to make use of probing and other interviewing techniques, and how to record and edit the interview. Needless to say, interviewers need the objective of every question, and the possible sources of data distortion, including ways of dealing with this distortion. Additionally, Van Dalen (1973), p. 330) recommends that the interviewer be kept ignorant of both the hypotheses being tested and the data returns. Knowledge of such information may create bias, thus influencing the manner in which the interviewers conduct the interview.

4. *Proper motivation and close supervision.* Horror stories on data being "manufactured" by interviewers in the comfort of their motel rooms are not uncommon. Such an eventuality can be avoided if interviewers are properly supervised and made to understand the importance of getting complete, accurate information. The evaluator should be aware of the possibilities of bias at various points in the data collection process and institute proper safeguards of minimizing it (Selltiz, Wrightsman, and Cook 1976, p. 572). Whenever resources permit, it is suggested that a field visit be made at least two times during the interview period—a visit after one-third of the respondents are interviewed and another visit after two-thirds of the respondents are interviewed. The visit may include checking on the interviewers' problem, progress, and accuracy of work.

   Accuracy of work is accomplished through spot checking. This may involve a visit by the evaluator to a few randomly selected respondents who have been interviewed. They are asked if they were in fact interviewed, including approximate length of interview time. However, when resources do not allow you to provide actual field supervision, you may either use the telephone or postcards as means of follow-up. Select a random sample of respondents and contact them by telephone or by mail using an easy-to-fill-out, self-addressed, stamped postcard verifying whether they participated in the interview. These procedures are important in checking whether the interviewers are in fact doing their job and not fabricating results.

5. *Reviewing completed instruments by the evaluator.* It is suggested that after the interviewers have turned in their completed interviews (at different points of time during the interview period), the evaluator go through each completed interview meticulously and check if all necessary questions are answered. Check also to see if there are no missing pages. Staple each set securely. The front pages of those that passed the inspection should be initialed and dated. *Those incomplete and/or highly doubtful questionnaires must be completed and discarded respectively, and respondents should be interviewed again whenever possible.* After the questionnaires are insepcted (i.e., those with complete *answers* and *pages*), they should be deposited in one place. If possible, tie all returns from one place and label them appropriately.

Checklist 12 is designed to help you deal with the problems of minimizing interviewer's bias.

Dealing with Social Desirability Bias

Another important source of data distortion is desirability bias, which is "a tendency to offer socially desirable answers . . . to answer questions in a way that conforms to dominant beliefs or patterns among groups to which the respondent feels some identification or allegiance" (Dillman 1978, p. 62). For example, some of your respondents may be located in communities where particular

CHECKLIST 12

Minimizing Interviewer's Bias

Instructions: Please respond appropriately to the following questions:

Yes	*No*	
☐	☐	1. Is the interview standardized allowing the interviewer as little free choice as possible?
		2. Does the interviewer's training include the following aspects of the study?
☐	☐	• Objectives of the evaluation
☐	☐	• Objectives of every question
☐	☐	• Sources of interview bias
		3. Is the interviewer trained in the following areas?
☐	☐	• Making initial contact
☐	☐	• Securing the interview
☐	☐	• Using the questionnaire
☐	☐	• Probing and other interview techniques
☐	☐	• Recording the interview
☐	☐	• Editing the interview
☐	☐	4. is there a mechanism for providing a regular check of the data collected?

schools are known to be popular. Socially desirable response bias is manifest when former vocational education students say they are satisfied with their training, even though they are not, because they do not want to express an opinion that runs counter to the dominant view.

There is a greater probability of social desirability bias in face-to-face interviews than with use of a mailed questionnaire. Such a probability can be compounded if the interviewer is personally known by the respondents or if the interviewer is known to be affiliated with the school. The following techniques are suggested to minimize social desirability bias:

1. Use of telephone interview or mailed questionnaire.
2. Employment of interviewers not personally known by the respondents. The use of vocational teachers or guidance counselors as interviewers, even with the use of the telephone, is discouraged.

How to Increase Generalizability of Interview Data

Good methodology dictates that you should strive to get 100 percent usable returns (i.e., complete, accurate answers) from every selected respondent, especially if you have a random sample. In cases where only a certain percentage of the sample reply or in cases where some completed interview schedules have to be discarded because the answers are inaccurate, it becomes inappropriate to generalize the total population from the data collected.

In this section, discussion focuses on strategies for increasing the rate of participation to increase generalizability of interview data. The following procedures are offered for the evaluator's consideration:

1. Identify sufficient resources from which to obtain updated addresses of former vocational education students.
2. Determine the best place to send precontact letters and the best site for the interview.
3. Design all correspondence in the most professional and appealing format.
4. Consider using the telephone as a method of precontact. Inform the respondents of the purpose and sponsor of the study and explain that a trained interviewer will call at their addresses.
5. Ensure that interviewers are trained to make proper initial contact—both at the door and inside the house. The Institute for Social Research at the University of Michigan (1976, p. 7) offers the following advice:

> At the doorstep you should state the course of action which you desire rather than ask permission for the interview. For instance, instead of asking, "May I come in?" to which a respondent could easily reply "No," say, "I would like to come in and talk with you about this." Avoid questions such as "Are you busy now?" or "Could I take this interview now?" or "Should I come back?" Questions which permit undesired responses can lead or even push a respondent into refusing to be interviewed.

Summary

The use of the interview for collecting data to measure training and job satisfaction provides two distinct advantages over the mailed questionnaire: it permits the study of complex and sensitive topics, and it allows the interviewer to check on the accuracy of answers (figure 6). However, there are also serious disadvantages: it is subject to interviewer bias, and it is costly. Thus, the evaluator needs to consider several factors before deciding to use the interview. Like other data collection methods, the evaluator needs to be thorough and exacting in the process to ensure a high degree of confidence in and generalizability of data collected (figure 7 and figure 8).

FIGURE 6

Interview: Advantages and Disadvantages

Interview:

Data are collected by talking with people either face-to-face or by telephone.

Should I use it?

Considerations

Advantages

- Does not require reading or writing by respondent
- Is adaptable to unforeseen circumstances
- Provides opportunity to obtain a representative sample of respondents
- Permits study of complex and sensitive topics
- Permits interviewer to check on respondents
- Permits the responding environment to be structured to some degree

Disadvantages

- Requires trained interviewers
- Is subject to unpredictable interviewer bias
- Tends to be difficult to structure because of large response volume
- High cost involved

FIGURE 7

Increasing Confidence in Interview Data

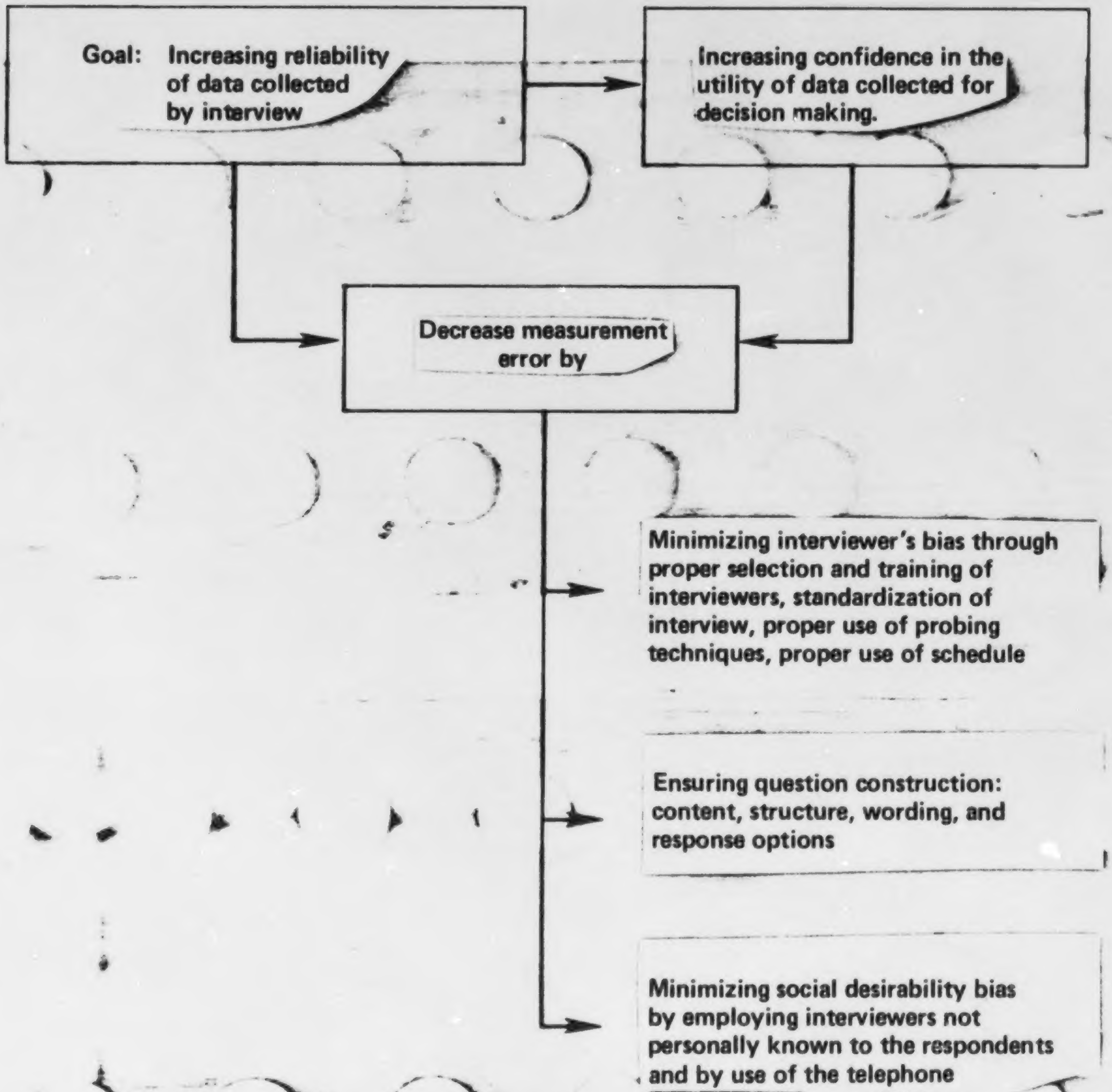
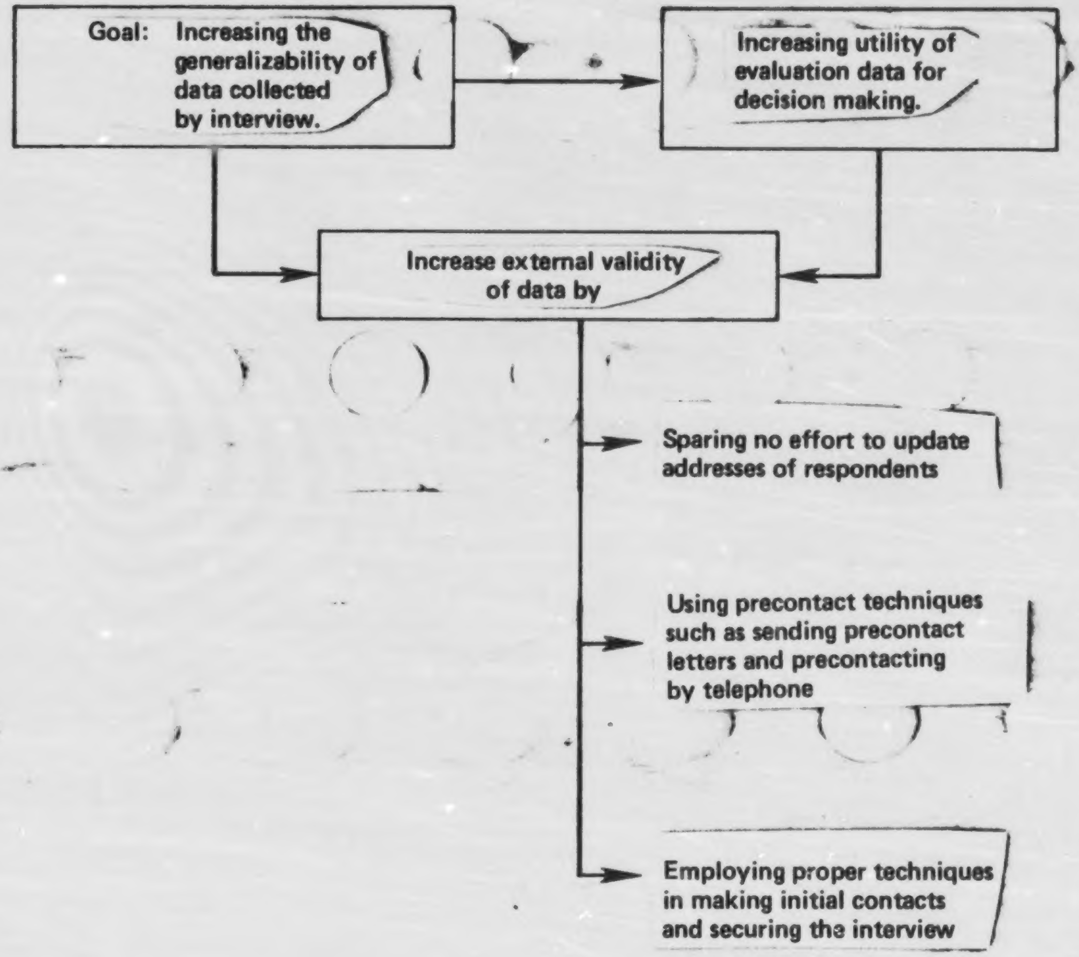

Goal: Increasing reliability of data collected by interview
Increasing confidence in the utility of data collected for decision making.
Decrease measurement error by
Minimizing interviewer's bias through proper selection and training of interviewers, standardization of interview, proper use of probing techniques, proper use of schedule
Ensuring question construction: content, structure, wording, and response options
Minimizing social desirability bias by employing interviewers not personally known to the respondents and by use of the telephone

FIGURE 8

Increasing Generalizability of Interview Data


Goal: Increasing the generalizability of data collected by interview.
Increasing utility of evaluation data for decision making.
Increase external validity of data by
Sparing no effort to update addresses of respondents
Using precontact techniques such as sending precontact letters and precontacting by telephone
Employing proper techniques in making initial contacts and securing the interview

CHAPTER VI

SOME QUALITATIVE METHODOLOGIES

Chapters 3 and 4 presented the two most common methods of data collection in survey research—mailed questionnaires and interviews. These methods make it possible to quantify and generalize results and to present evaluation findings to information users. However, the underutilization of qualitative methods by evaluators has been the subject of increasing criticism (Wolf et al. 1979, p. 1). One of the reasons is that results tend to be oversimplified, and therefore sometimes are misleading. A presentation of data resulting from these types of studies lacks detail which would provide the reader with a holistic view of a program.

In many cases, it becomes necessary to use qualitative methods as a complement or supplement to quantitative measures. Complex situations are better understood when dealt with in terms of the dynamics of the social processes involved. Use of qualitative as well as quantitative measures provides a better understanding of the multiplicity of causes associated with given outcomes in vocational education (McCaslin 1978, pp. 4-6), and of the fact that there are "multiple realities and multiple perceptions and interpretations" (Wolf et al. 1979, p. 3). Bogdan and Taylor (1975, p. 4) say:

> Qualitative methodologies refer to research procedures which produce descriptive data: people's own written or spoken words and observable behavior. This approach . . . directs itself at settings and the individuals within those settings holistically; that is, the subject of the study, be it an organization or an individual, is not reduced to an isolated variable or to a hypothesis, but is viewed instead as part of a whole.

It is the purpose of this chapter to introduce the reader to participant observation and unobtrusive measures—qualitative methodologies—that may be appropriate in measuring training and job satisfaction of former vocational students. Unobtrusive techniques are those data collection techniques that do not require contact with the individual—observation, physical trace measures, and research of archives or records (Kester 1979, p. 53). Discussion in this chapter is focused on the following topics: types of unobtrusive measures that may be applicable in measuring training and job satisfaction of former vocational students, advantages and disadvantages of using qualitative data in measuring training and job satisfaction of former vocational students, and techniques employed in data collection by observation. (For further discussion on qualitative methods, refer to Kester 1979 and Spirer 1980.)

Participant Observation

The use of participant observation techniques is relatively new in vocational education evaluation. A review of 1,500 studies on the effects of vocational education (Mertens et al., 1980) showed that qualitative methods for measuring training satisfaction and job satisfaction are virtually never used.

Participant observation has been traditionally an anthropologist's methodology. It is used synonymously with field observation, qualitative observation, ethnographic techniques, and direct observation—all of these referring to a condition wherein the researcher is immersed in the system under study while in the process of data collection. Three advantages are cited by Bouchard (1976, p. 385):

> ... [First], it focuses the researcher's attention on the behavior of individuals rather than simply on their verbal interview or test-taking behavior. ... A second advantage is that it tends to force the researcher to look at the whole [person], the whole organization, and the whole environment [social and physical] in an integrated way ... [and third], it puts the ... [evaluator] in the context of discovery.

The evaluator is, however, warned that "the price of doing fieldwork is extremely high, not in dollars ... but in physical and mental effort" (Bogdan and Taylor 1975, p. vi). It is often necessary for the evaluator to lead two lives simultaneously—"as a participant in whatever little world is under study while, at the same time, attempting to make sense out of the world as an observer" (Bogdan and Taylor 1975, p. vi). The succeeding two sections detail two most common methods (Lofland 1971) of the participant observation technique.

Unknown Observer

In this situation the observers do not identify themselves. They, therefore, assume incognito roles and remain unknown as such to many, if not all, members of the setting (Lofland 1971, p. 94). For example, a group of Hispanics who are former vocational education students may be employed by a firm. Hispanic observers may be hired to gather data as unknown observers. They may take jobs, and so join the group for the purpose of collecting data. In this type of situation, to gather data on job satisfaction as unknown observers may be the most effective method.

Advantages:

1. *Richer materials provided.* As one of the group, the observer becomes friends with some members and therefore is quite likely to be entrusted with their intimate thoughts and feelings, a situation that is unlikely if the observer is known.
2. *Possibly the only way to gather information.* Certain settings may not be amenable to other data-gathering methods. In this case, "being an unknown observer may seem better than doing nothing" (Lofland 1971, p. 94).

Disadvantages:

1. *Ethical questions.* There have been some objections as to the morality of observing and analyzing people without telling them this is taking place. However, some sociologists feel that "as long as reports conceal names, locations, and the like, thereby preventing the analysis from being used against the participants, there is no harm done" (Lofland 1971, p. 94).
2. *Limitations on observation.* The observers play specified roles so they may be cut off from valuable channels of communication of information. Additionally, since a good part of the observers' time is spent performing a role, they are therefore constrained in terms of time and place from doing observational work, including jotting down notes.

3. *Biased viewpoint effect.* It is possible that the observers may "selectively expose [themselves] to the data or selectively perceive them and, worst yet, shift over time the calibration of [their] observation measures" (Webb et al. 1966, p. 114). Further, it may be difficult for the observer to disengage or disentangle their emotional involvement.

Known Observer

Formal or informal permission is often needed from "gatekeepers" to allow observers to visit the employees in their working environment for the purpose of collecting data. Both the employer and the employees (former vocational education students) know that observers will be visiting them to collect information. There are both advantages and disadvantages of this method.

Advantages:

1. *Greater degree of freedom to collect information.* Since the observers do not have an "extant role in the setting, there is a greater degree of freedom for [them] to move, observe, and ask questions" (Lofland 1971, p. 95). The observers can freely take notes and schedule time.
2. *Fewer ethical problems.* Since the subjects know that they are being observed, no deception is involved and few questions on ethics arise.

Disadvantages:

1. *Superficiality or marginality of observation.* Unlike the case of unknown observers, who become the members of the group under study, "it can become quite evident to the known observers that, although they are in that world, they are not truly a part of it (Lofland 1971, p. 97).
2. *Personal involvement bias.* The observers who become personally involved with the problems of employers or employees are likely to be less objective, and like the unknown observers, suffer from biased viewpoint effect. Writing an objective report and analysis becomes difficult.
3. *Observer effect.* The known observers can produce changes in behavior among the observed groups, thus affecting the validity of the data recorded. As a strategy, Webb et al. (1966, p. 113) suggest that the observer contaminant be permitted to wear off and that analysis of data start subsequent to the time when the effect is negligible.
4. *Problem of acceptance.* Related to the problem of observer effect is the problem of acceptance. The observers may be viewed as intruders, or worse yet, as tools of management sent to spy on the employees. If this happens, it becomes difficult for observers to get honest reactions.

Strategies for Successful Observation

Successful observation requires a good observer—a person with the necessary personal and technical skills. Thorough planning and preparation are also important. The person doing the observational work must match the general and the specific requirements of the social settings where observation is to take place, which is sometimes difficult due to the diversity of personalities among those being observed. However, under no circumstances must observers with personality styles that make it difficult for them to "blend" with the observed group be hired.

In addition to certain personality requirements, a good observer needs certain special skills for successful observation. These include an ability to listen, to make notes (both mental and written on and off the field), and to write reports (see table 4). Observers should know what to look for. Thus, evaluators hiring inexperienced observers need to pay particular attention to their training. There should be adequate practice before inexperienced observers are assigned to actual field work.

We are now ready to move into the next section of this chapter. However, before you begin to read the next section, take a few minutes of your time to examine your strategies for successful observation by answering the questions in checklist 13.

Unobtrusive Measures

As defined earlier, unobtrusive measures are those data collection procedures that do not require contact with the respondents, thereby avoiding contamination by reactivity, an integral part of interviews and participant observation. However, "lack of reactivity in a method does not mean that the data generated are valid" (Bouchard 1976, p. 399). Four classes of unobtrusive measures are physical trace, archives, measures gathered by hardware, and simple observation (Webb et al., 1966). The first three measures are discussed in this section.

Physical Trace

Physical trace techniques are the examination of physical evidence that gives clues of students' training satisfaction and job satisfaction. "They are, therefore, most prone to misinterpretation and should be used with caution" (Bouchard 1976, p. 399). Acting like a detective, the evaluator is trying to identify for physical evidence that lead to conclusions. A few of the possible indicators of students' satisfaction with their training include—

- wear and tear on instructional books and equipment,
- number of books checked out,
- amount of consumable instructional materials used.

Archives and Records

Documents and records can be very useful as sources of data to determine students' satisfaction with their training and job. However, the evaluator should exercise "prudence and caution because these materials can never be taken at face value" (Bouchard 1976, p. 400). For example, a record of leave of absence may not indicate the reason leave was taken. A variety of causes, such as health problems, are possible. Some examples of documents and records to investigate are as follows:

Satisfaction with Training

- Letters from former vocational students
- Attendance records at alumni meetings and reunions

Job Satisfaction

- Daily time record
- Leave of absence records
- Requests for transfer or promotion
- Pay levels
- Turnover rate
- Record of strikes and grievances

TABLE 4

Some Rules of Thumb in Participant Observation

Entering the Field	• In the initial stage of the fieldwork, it is not advisable to challenge the behavior or statements of subjects or to ask questions that are likely to put them on the defensive.
Establishing Rapport	• Observers should conduct themselves in such a way that events occurring during their observations do not significantly differ from those occurring in their absence. • Probably the easiest way for observers to gain rapport with their subjects is to establish what they have in common with them. • To participate in activities of the subjects is helpful.
Developing Relationships	• Researchers should refrain from developing close relationships with individual subjects while they do not have a good grasp of the nature of relationships in settings. • Where it is essential for them to establish rapport with a few selected subjects initially, they should be willing to withdraw from those relationships as circumstances demand.
Asking Questions	• Questions should be asked in such a way as to enable the subjects to talk about what is on their minds and what is of concern to them, without forcing them to respond to the observer's interests, concerns, or preconceptions.
Field Notes	• Field notes should be recorded after each and every observation period, as well as after more casual contacts with subjects outside the setting. • Observers should develop a level of concentration sufficient to enable them to commit to memory everything they see, hear, smell, and think.

Note: Ideas in making this table were taken from R. Bodgan and S. Taylor, *Introduction to Qualitative Research Methods*, New York: John Wiley & Sons, 1975.

CHECKLIST 13

Strategies for Better Observation

Instructions: Take time to review your strategies for improving observation data gathered by answering the following questions.

Yes	*No*	*Personality Considerations*
☐	☐	1. Is the observer reasonably able to get along with the subjects under study?
☐	☐	2. Do the observers like the subjects, even though they may not agree with their views?
☐	☐	3. Can the observers know how to become inconspicuous and inoffensive in the setting?
		Technical Skills
☐	☐	5. Do the observers know how to take good mental notes?
☐	☐	6. Do the observers know how to translate mental notes into written notes?
☐	☐	7. Do the observers know the technique of taking good written notes?
		8. Were the observers trained in the following mechanics of making full field notes?
☐	☐	• Writing promptly
☐	☐	• Writing effectively
☐	☐	• Dictating, handwriting, or typing reports

Hardware

Although the review of studies since 1968 on the effects of participating in vocational education (Mertens et al. 1980) did not show the use of hardware as a data-gathering technique, recent advances in dark photography and microrecorders make it possible to gather quality data and information with the use of hardware. Some of the possibilities (Bouchard 1976, p. 401) include the following:

1. Use of microtransmitters to record conversations among or between employers and employees
2. Use of hidden tape cassettes to record conversations among or between employers and employees
3. Use of photoelectric cells to record movements of people and some types of objects past key points
4. Use of hidden camera or dark photography to get pictures of employees during work period

At this point, a word of caution is in order for those who wish to use hardware as data collection tools. There are a number of laws that protect the privacy of individuals. Violations are criminal acts and subject to lawsuits. Additionally, many researchers feel that collecting data from people without their knowledge is unethical. Thus, before deciding to use hardware as data collection tools, the issues of possible criminal violations and ethics need to be resolved.

Summary

The use of participant observation and unobtrusive measures are relatively new in vocational education evaluation. In fact, studies on training and job satisfaction of former vocational students during the last eleven years show that the employment of qualitative evaluation methodology is practically nonexistent. However, there is currently a growing trend for the use of qualitative data, in addition to quantitative data, to provide better understanding of programs being evaluated.

The use of participant observation and unobtrusive measures requires the evaluator to recognize possible sources of internal invalidity and to apply appropriate controls. In addition, the evaluator must be able to recognize the limitations as well as the strengths of data gathered by qualitative means.

CHAPTER VII

DATA ANALYSIS AND INTERPRETATION

In measuring the training satisfaction and job satisfaction of former vocational students, you are likely to collect a large mass of data. Then, your problem becomes that of summarizing and arranging the data so they can be understood, communicated, and utilized. Statistics can help you solve this problem by condensing your large amount of information into all-encompassing numbers so these "numbers can be talked about, remembered, and used as bases for making decisions, forming opinions, or developing theories" (Fitz-Gibbon and Morris 1978, p. 11).

This chapter introduces you to some data analysis and interpretation techniques that can be used to measure the training satisfaction and job satisfaction of former vocational students. These include descriptive statistics for summarizing data systematically and inferential statistics for making generalizations and interpretations.

It is anticipated that some readers may be interested in a more in-depth treatment of the statistical tools discussed in this chapter. These readers are referred to selected sources in the bibliography (i.e., Tatsuoka 1971; Weiss 1976).

Descriptive Statistics for Summarizing Data

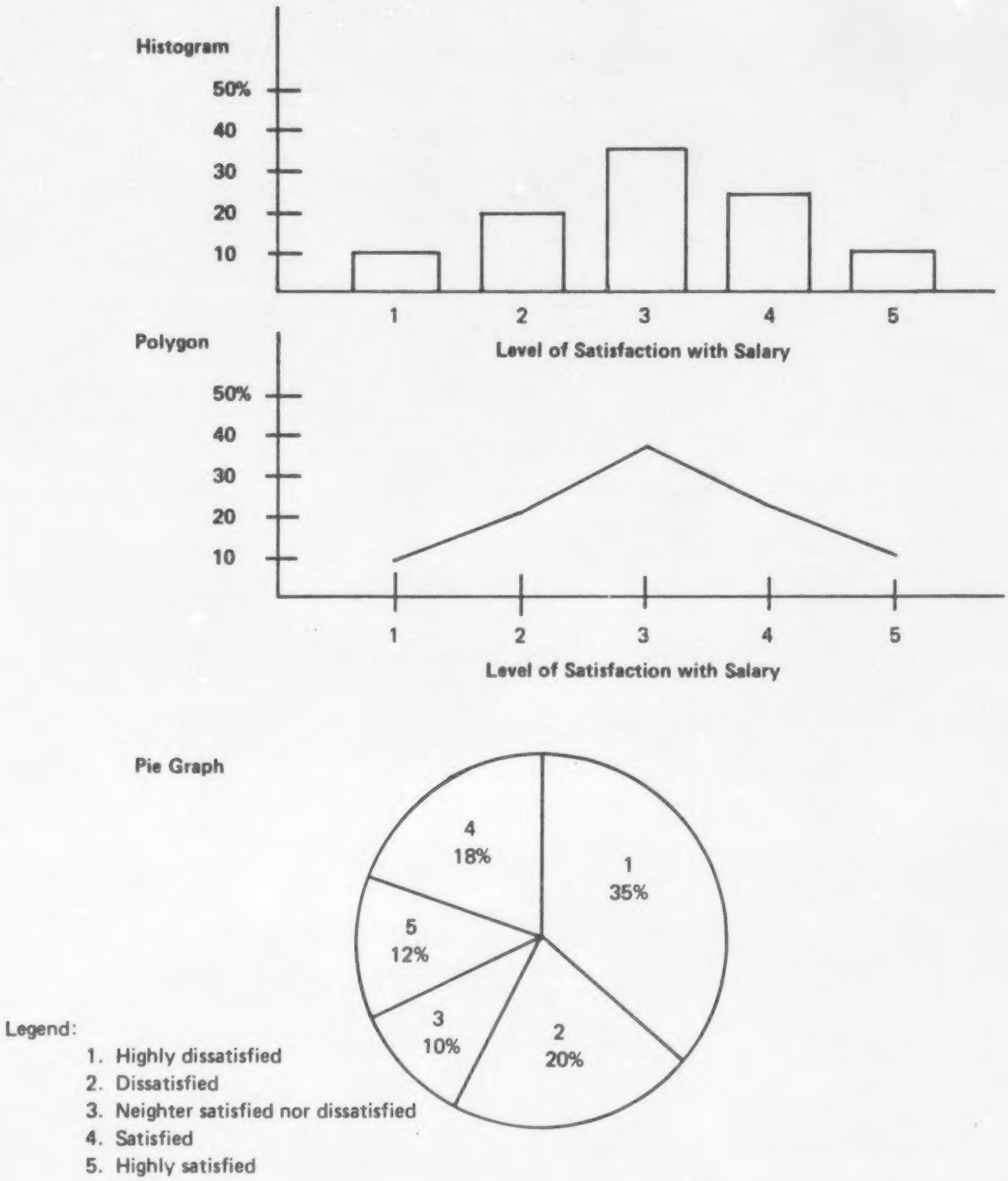
The kind and amount of data collected depend on the study objectives. Your data may therefore include, in addition to your dependent variables, some or all of the following predictors or independent variables: demographic (sex designation, ethnicity, and age); socioeconomic status (parents' income or parents' educational background); type of vocational program in which enrolled; present occupation and salary; and other variables of interest. Needless to say, these data need to be systematically summarized by use of descriptive statistics for ease in presentation and comprehension. This section presents some statistics designed to help you in this area.

Frequency

Frequency refers to the number of times a specific item occurs. For example, you may want to know the frequency distribution of your respondents (former vocational students) in terms of some predictor variables like sex designations, ethnicity, and vocational programs in which they are enrolled. Besides the usual frequency table distribution, these data can be graphically presented in a variety of ways that will facilitate comprehension, such as the use of a histogram, polygon, or pie graph. In addition, frequency data can be presented as distributions of simple frequencies, percentage frequencies, or cumulative frequencies. Your type of data, the central theme of your study, and the kind of audience receiving the report are the major factors that need to be considered in determining the best way to present your data. Figure 9 includes some different uses of graphic presentations to illustrate percentage distribution.

FIGURE 9

Graphic Presentations of Percentage Distributions
(Degree of Satisfaction with Salary of Former Vocational Students)



Measures of Central Tendency

Measures of central tendency, which means average, include the following: arithmetic mean, median, and mode. Average is commonly defined as a number indicating the central value of a group of observations. The average offers two important functions:

> First, it is a shorthand description of a mass of quantitative data obtained from a sample. . . . An average is, therefore, descriptive of a sample obtained at a particular time in a particular way. Second, it also describes indirectly but with some accuracy the population from which the sample was drawn (Guilford and Fruchter 1973, p. 42).

Let us take salary satisfaction score as an example. The mean is the arithmetic average of the scores of the respondents. The mean is computed by adding all the scores of the different respondents and dividing it by the total number of respondents; thus, the mean can be heavily influenced by extremes, particularly in a small number of cases. The median is the midpoint between the highest and the lowest score, above or below which are half the respondents. The mode is the score with the highest number of respondents. The example that follows illustrates the three different methods of measuring central tendency.

DATA COMPILED FROM A STUDY OF
FORMER STUDENTS' JOB SATISFACTION

Salary satisfaction score (x)	*Code*	*Frequency (f)*		*Product (f)(x)*
5	Highly satisfied	10		50
4	Satisfied	20		80
3	Neither satisfied nor dissatisfied	35		105
2	Dissatisfied	18		36
1	Highly dissatisfied	12		12
	Total number of scores =	95	Sum of all scores =	283

Mode — The most frequently occurring score = 3

Median — The score that is midpoint between the highest and lowest score = 3

Mean — Sum of all scores divided by the total number of scores = 283/95=2.98

Where the distribution is reasonably symmetrical, the arithmetic mean is usually preferred and is most useful because it is generally the most reliable or accurate. It has stability and consistency; thus, it is better suited for arithmetical computations, as will be seen later in the chapter. On the other hand, as suggested by Fitz-Gibbon and Morris (1978, p. 26), the median is used rather than the mean if (1) you will not need to perform statistical tests requiring the mean, (2) if you need a quick estimate of group performance, or (3) if the distribution is not symmetrical. Additionally, if the level of measurement of your variables is nominal, only the mode is meaningful.

Measures of Variability

Measures of variability are also known as measures of dispersion, heterogeneity, scatter, or spread. It is used to describe important characteristics of distributions, i.e., the variability of the scores. Using the salary satisfaction scores as an example, measures of variability answer the question: how varied are the scores that contribute to the mean salary satisfaction score of the group? There are two general measures of variability discussed in this chapter: the total range and the standard deviation.

The total range is easily determined, but it is also a highly unreliable measure because it is based only on two values. Again using salary satisfaction score as an example, the range is computed by subtracting the lowest reported score from the highest reported score. Different groups of respondents and types of vocational programs can be only crudely compared on the basis of their range of salary satisfaction scores.

The standard deviation is "the most commonly used indicator of degree of dispersion and is the most dependable estimate of the variability in the total population from which the sample came" (Guilford and Fruchter 1973, p. 65). The standard deviation of the salary satisfaction scores of former vocational students is a statistic indicating how much the scores are spread out around the mean. The smaller the standard deviation, the less spread are the scores. Knowing the standard deviation of a group of measurements performs two functions (Morris and Fitz-Gibbon 1978, p. 30):

- It provides a good means for describing the spread of certain measures (e.g., income or perception on the quality of training) obtained from the administration of a particular instrument.
- It provides a basis for later statistical procedures that you may want to perform, such as a test of the significance of differences between group means.

The example below will help you differentiate between the two types of measures:

Salary satisfaction score (x)	*(x^2)*	*Frequency (f)*	*(f)(x)*	*$(f)(x^2)$*
5	25	10	50	250
4	16	20	80	320
3	9	35	105	315
2	4	18	36	72
1	1	12	12	12
		n = 95	Sum = 283	Sum = 969

Range = highest score - lowest score
= 5 - 1 = 4

Standard deviation = $n(fx^2) - (fx)^2 / n$
= $100\ (969) - (283)^2 / 95$
= 1.36

Some Inferential Statistics for Making Generalizations

Evaluators and users of evaluation information are keenly interested in the generalizations and conclusions arrived at on the basis of the data collected from the sample respondents. More than any facet of the evaluation report, perhaps, the generalizations and conclusions have the greatest influence on decisions affecting policy and program improvement. Thus, no effort should be spared in your methodology to enable you to achieve defensible and clear generalizations about your evaluation study. Inferential statistics is the "body of methods for arriving at conclusions extending beyond the immediate data" (Hays 1973, p. v). It aids in drawing conclusions about a population from a sample or group of samples. Recent advances in computer programs have made it possible for evaluators to answer difficult questions which would not have been possible a decade ago because of the magnitude of mathematical computations. This section details some inferential statistics that you may use in arriving at certain conclusions in measuring the training satisfaction and job satisfaction of former vocational students.

Univariate Procedures

Univariate procedures are statistical techniques dealing with one dependent variable, regardless of the number of independent variables (Anderson et al. 1975, p. 251). If you treat training satisfaction and job satisfaction as global variables, as in the example that follows, then your inferential statistics deal with univariate procedures such as the t-test and analysis of variance. Multiple regression analysis, although classified by some statisticians as a multivariate procedure (Tatsuoka 1971, p. 1), is included in this section to differentiate it from other statistical analyses dealing with multiple dependent variables.

Question: To what degree are you satisfied with your vocational training as having prepared you for your first job? (Circle one)

5 Highly satisfied
4 Satisfied
3 Neither satisfied nor dissatisfied
2 Dissatisfied
1 Highly dissatisfied

You should be aware that in using the foregoing statistical tools, certain assumptions need to be met and that if certain assumptions are violated, there are adverse consequences. Additionally, you should be aware of the specific functions of a specific statistical tool. A good evaluator should then be able to answer the "what," the "when," and the "how" of each statistical procedure employed in the data analysis. Table 5 details some univariate procedures, their uses, and their limitations.

Multivariate Procedures

Multivariate procedures refer to a series of statistical techniques for analyzing a set of dependent or outcome variables. Earlier discussion in this handbook shows that training satisfaction or job satisfaction have multiple objectives, aspects, or components. Thus, "job satisfaction can be seen in terms of an individual's satisfaction with his pay, his supervisors, working conditions, and the amount of variety his job provides" (Weiss 1976, p. 327). Likewise, training satisfaction can be viewed as a multivariate measure of former students' satisfaction with training facilities, curricular contents, teaching methods, or school services as shown on the next page.

Multiple variable investigation provides good payoffs in terms of providing the evaluators and users of evaluation information with considerably more information than that provided by univariate procedures. However, "it does raise problems which dealing with a single variable does not" (Weiss 1976, p. 328), because it becomes difficult to comprehend and synthesize the mass of all the available information. For example, the question of who are the former vocational students who are the "most job satisfied," or for that matter, the "most satisfied with their training," is too complex for an observer to answer. One former vocational student might be highly satisfied with the training facilities and curricular contents, but highly dissatisfied with teaching methods and school services; another respondent might have a reverse rating.

TABLE 5

Some Univariate Procedures

Statistical Techniques	*Functions*	*Assumptions and Limitations*
1. t-test	Used mainly to test hypotheses about the difference between two means. It can answer such questions as • Does the training satisfaction of postsecondary students differ from that of secondary students?	• Random sample of respondents from two normal populations • Equal Ns • Equal variance • Dependent variable measure is interval or ratio
2. Analysis of Variance (ANOVA)	Used to test hypotheses about the differences between three or more means. It can answer such questions as • Are the different groups of former vocational students significantly different in their job satisfaction?	• Random sample of respondents from three or more normal populations • Equal variance • Dependent variable measure is interval or ratio
3. Linear Multiple Regression Analysis (LMRA)	Two or more criterion variables are used to predict a univariate dependent variable. It can answer such questions as • What situational variables (e.g., salary, type of job, high school GPA, etc.) are associated with the training satisfaction of former vocational students?	• Random sample of respondents • Large sample (e.g., 60 or more) • Normal distribution • Appropriate for data that do not violate the assumption of linearity • It is a maximization procedure. It tends to capitalize on sample-specific covariation to give results that are artificially inflated due to unique characteristics of the sample.

In this regard, multivariate procedures can help the evaluator by providing an organizing function to permit better understanding of the data. In addition, it can help the evaluator in making better predications (Weiss 1976, p. 328). Tatusuoka (1971, p. 1) says:

> Multivariate analysis is concerned with a group (or several groups) of individuals, each of whom possess values or scores on two or more variables such as tests, or other variables. We are interested in studying the interrelations among these variables concerning the populations from which the sample groups were chosen.

Four multivariate procedures are explained in table 6: discriminant analysis, factor analysis, canonical correlation, and multivariate analysis of variance (see figure 10). You are encouraged to examine these statistical tools in more depth before attempting to use them. Further, since multivariate analytical procedures require the use of computers and special computer programs, you may also like to consult the personnel handling the computer needs of your agency for advice and guidance.

Question: Rate the degree to which you are satisfied with each of the following aspects of your vocational program in preparing you for your first job.

	Highly Satisfied	*Satisfied*	*Neither Satisfied nor Dissatisfied*	*Dissatisfied*	*Highly Dissatisfied*
1. Training Facilities	☐	☐	☐	☐	☐
2. Curricular Contents	☐	☐	☐	☐	☐
3. Teaching Methods	☐	☐	☐	☐	☐
4. School Services	☐	☐	☐	☐	☐

TABLE 6

Some Multivariate Procedures

Statistical Techniques	Use	Assumptions and Limitations
1. Discriminant Analysis	To find the linear combinations of variables which best dominate among a set of predefined groups. In measuring the training and job satisfaction of former vocational students to: 1. Determine which ways the students in the different vocational programs are most dissimilar on a given set of variables like training satisfaction, job satisfaction, etc. 2. Predict job termination from the multivariate measures of job satisfaction.	1. Appropriate only for data that do not violate the assumption of linearity. 2. Limited by random samples of respondents. 3. As a maximization procedure, it is highly susceptible to sample-specific covariation.
2. Factor Analysis	1. To summarize data and to identify structures in the data not immediately evident. The summarization is a much more ambitious undertaking than that involved in a simple statistical summary. 2. To summarize and clarify all the interrelationships among the variables involved in a study. To avoid factor-analyzing worthless data, researchers should first test their intercorrelation matrix for statistical significance and proceed to perform factor analysis only if they conclude that their data represent significant deviations from a random intercorrelation matrix.	1. Random sample of respondents 2. Interval type of data 3. Multivariate normality

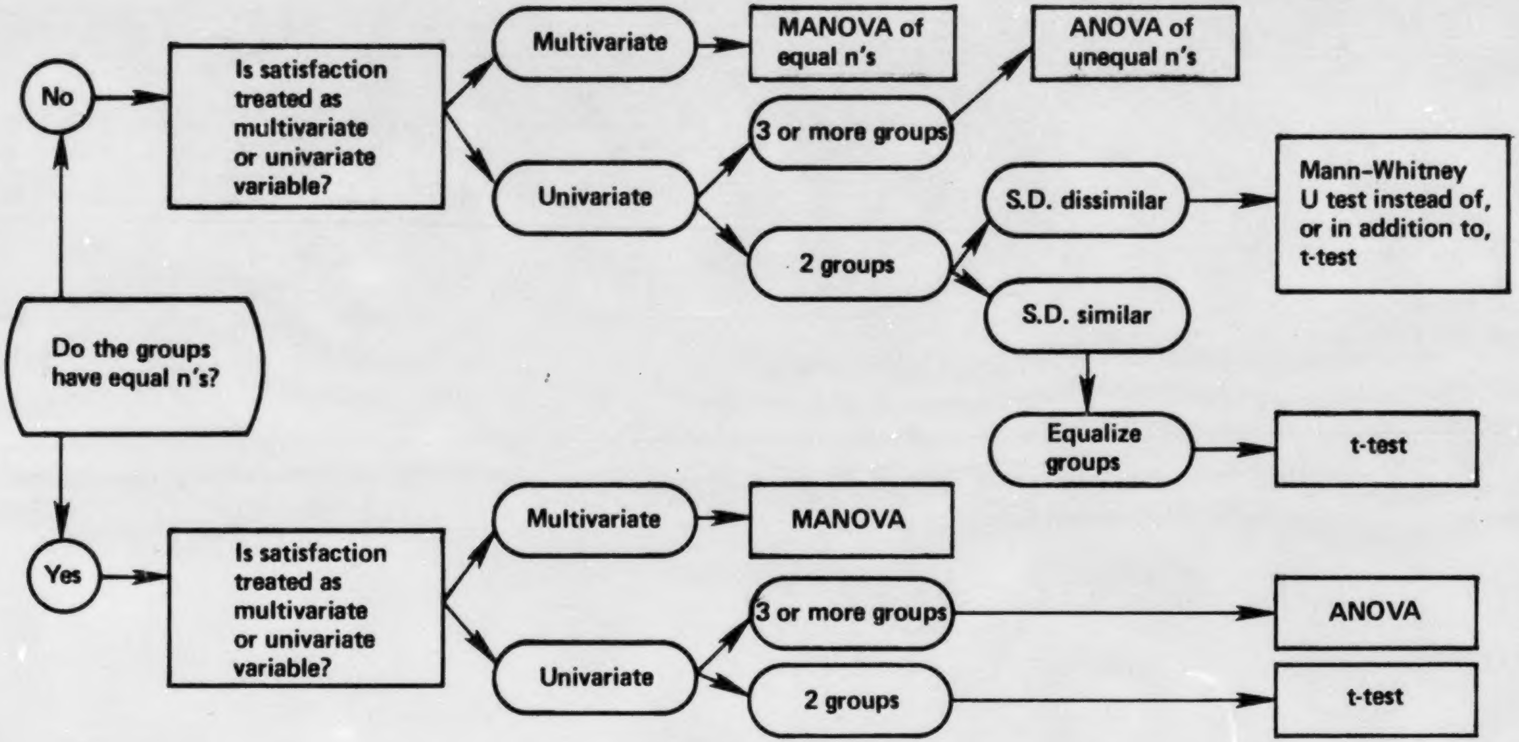
Table 6 (continued)

Statistical Techniques	Use	Assumptions and Limitations
3. Canonical correlation	Canonical correlation is the extension of linear multiple regression to the case of multiple criterion variables. It is appropriate for the situation in which a set of continuous predictor variables is to be related to a set of criterion variables. Essentially, a separate set of weights is found for each set of variables such that, if these weights are used to find the weighted sums of each set, the two weighted sums will be correlated as highly as possible. For example, canonical correlation can be used in predicting a multivariate criterion measure of job satisfaction with pay, working conditions, etc., from a set of training satisfaction measures or demographic variables.	1. It is appropriate only for data that do not violate the assumption of linearity, i.e., all realtionships between each criterion variable, within the predictor set and within the criterion set are linear. 2. Random samples of respondents 3. It is a maximization procedure; thus, it tends to capitalize on sample-specific covariation to give results that are artificially inflated due to unique characteristics of the sample.
4. Multivariate Analysis of Variance (MANOVA)	MANOVA is the multivariate analogue of the analysis of variance (ANOVA) in univariate statistics and is most commonly used in testing the differences among means measured on independent groups of subjects. MANOVA applies to a set of means; whereas a one-way ANOVA tests the differences among the means of, say, five groups of former vocational students, a one-way MANOVA can test the differences among sets of means of several different variables. For example, you might compare the differences on the multivariate measures of job satisfaction for different types of training programs. MANOVA can give one overall significance for the group differences.	1. Random sample of respondents 2. Normal distribution 3. Equal variance 4. Dependent variable measure is interval or ratio

Note: Some ideas in this table were taken from David J. Weiss, "Multivariate Procedures" in M. Dunnette (ed.), *Handbook of Industrial and Organizational Psychology* (Chicago: Rand McNally College Publications Co., 1976), and S. B. Anderson et al., Encyclopedia of Educational Evaluation (San Francisco: Jossey-Bass Publishers, 1975).

FIGURE 10

Decision Tree for Selecting a Statistical Test of Significance


Do the groups have equal n's?
No
Is satisfaction treated as multivariate or univariate variable?
Multivariate
MANOVA of equal n's
Univariate
3 or more groups
ANOVA of unequal n's
2 groups
S.D. dissimilar
Mann-Whitney U test instead of, or in addition to, t-test
S.D. similar
Equalize groups
t-test
Yes
Is satisfaction treated as multivariate or univariate variable?
Multivariate
MANOVA
Univariate
3 or more groups
ANOVA
2 groups
t-test

Summary

Two types of statistics are generally employed to analyze and interpret data: descriptive statistics for summarizing data and inferential statistics for making generalizations and interpretations. Descriptive statistics may include frequency counts, measures of central tendency (mean, median, and mode), and measures of variability (range and standard deviation).

Where data are collected from a sample, inferential statistics facilitate conclusions beyond the immediate data. Whether univariate or multivariate procedures are employed depends upon the treatment of dependent variable(s). Univariate procedures are statistical techniques dealing with one dependent variable, and it is appropriate when training satisfaction and job satisfaction are treated as global variables. These include t-test, analysis of variance, and multiple regression analysis. Multivariate procedures refer to a series of statistical techniques for analyzing a set of outcome variables. These include MANOVA for testing differences among sets of means, discriminant analysis, factor analysis, and canonical correlation. The use of specific statistics depends upon the type of data and the objectives of the study.

CHAPTER VIII

DATA PRESENTATION AND UTILIZATION

Data on student satisfaction with their training and job generally are categorized as follow-up data. However, minimal attention appears to be given to their interpretation and presentation. One can surmise that this minimal attention contributes to the lack of utilization for accountability, decision making, and program improvement.

This chapter describes selected reporting and display techniques and strategies for increasing the utilization of evaluation results. Emphasis is given to the presentation and utilization of data and information on student satisfaction with their training and job. Moreover, the focus is on the relationship of these data and information to accountability, decision making, and program improvement at the state and local education levels.

However, this chapter provides only a basic introduction to the presentation methods and to the theory and practice of evaluation data and information utilization. The reader is encouraged to review *Guidelines and Practices for Improving the Utilization of Evaluation Results* (Franchak 1981). This handbook provides an in-depth treatment of this important and complex subject.

Data and Information Presentation

At the beginning of this section, we wish to make a distinction between data and information. Mercer and Koester (1978, p. 85) offer such a distinction:

> Information comes from data, which are *logical representations of measurements, observations, and computations.* Logical is here defined as orderly, intelligible, objective, and capable of forming accurate relationships based on principles and rules of reason [italics added].

Further, they add that not all data are information, that is, capable of being assigned a useful meaning.

As discussed in the preceding chapter, the assessment of the training and job satisfaction of former vocational education students is a complex undertaking, and the process of data and information interpretation is equally difficult. This consists of taking the information resulting from the data analysis process and subjecting it to expert scrutiny. Such an examination should result in an explanation of the displayed information in terms that are comprehensible to decision makers and other information users for accountability, policymaking, and program improvement.

The interpretation and presentation of analyzed data on student satisfaction with their training and job can best be performed by the professional staff, the evaluator, or data analyst. However, top managers in the organization at either the state or local levels must feel comfortable with the fact that these individuals know vocational programs, are credible and competent evaluators, are familiar with problems facing the managers, and have a deep concern for the target audiences. Equally important to this process is the need for the evaluator or data analyst to view these data as integral elements of a comprehensive management information system.

Moreover, these data need to be considered as only one element of information contained in a management information system (MIS). For example, a preliminary step in organizing the data interpretation and presentation function of an MIS is deciding which program area (i.e., agriculture, technical, or health), by function (i.e., personnel development-teacher, inservice, or curriculum development), facilitates the needs of a specific education agency at the state (SEA) or local (LEA) level.

The presentation of data and information on student satisfaction with their training and job by LEAs and SEAs may be in a variety of forms depending upon the user they wish to reach: (1) the general public, (2) education planners, (3) educational administrators, and (4) other target audiences such as the board of education, program advisory committees, and legislature.

Each of these audiences has different needs. The general public does not usually require a detailed report. A one- to three-page report highlighting the results of the assessment of the former students' satisfaction with their training and job may be sufficient. Educational administrators and selected audiences may be interested only in a one-page executive summary and a list of conclusions and recommendations. Educational planners, by contrast, may need a detailed "technical" report to enable them to recommend or develop specific strategies for program changes and for other purposes.

Conceivably, then, there are varying types of reports for presenting the results of assessing former vocational education students' satisfaction with their training and jobs—each type of report being prepared according to the unique requirement of a specific target audience:

1. Highlight report for the general public
2. Executive summary for educational administrators of the advisory council and board of education
3. Detailed "technical" report for educational planners, classroom/laboratory instructors, counselors/placement personnel, and other interested persons

Reporting Recommendations

In disseminating a report on the assessment of former vocational students' satisfaction with their training and job, a common mistake is to distribute the same report to all audiences. As discussed in the previous section, one must identify the audiences whom the report is intended to serve and the purpose of the report—accountability, decision making, or program improvement. It is not uncommon for an LEA or an SEA to distribute hundreds of final report copies with fifty or more pages. This practice is not only costly, but also of questionable value. The general public needs straightforward summary information and is probably confused by technical data and a sheer mass of information. The administrator, on the other hand, who simply does not have the time nor technical expertise to review the entire contents to recommend policy action or determine program decisions, may never read it. Only the educational planner, classroom/laboratory instructor, counselor/placement personnel may need to know all the detailed information. Thus, a related consideration in the strategies for presentation and utilization must be the *length of the report.* In a study to determine appropriate reporting formats for educational decision makers, Brickell, Aslanian, and Spak (1974, p. 99) state:

> Top officials and management staff were more likely to ask for short reports; program and project specialists were more likely to request medium or long reports in their areas of specialization.

Further, they conclude that differentiated responsibilities require differing lengths of reports, despite the preference for brevity. Proposed length of reports for decision makers are short (one page); medium (ten pages); and long (100 pages) (Brickell, Aslanian, and Spak 1974, p. 99).

The alternative reports on student satisfaction with their training and job satisfaction must be weighed in terms of the targeted reading audience. At the state level, all three reports might be prepared. If the state evaluators conduct the assessment of student satisfaction with their training and job of all former students or a sample of the total population, it seems advisable that state evaluators also prepare statistical reports for each of the LEAs. At the local level, the detailed report and the executive summary should be minimal requirements.

Preparing the Content and Information Packaging

Generally information about vocational programs is prepared for one of three types of functions: (1) public information or public relations, (2) administrative decision making, and (3) program decision making. Each of these uses requires a different strategy for content development and style of packaging. Under normal circumstances, it is not advisable to photocopy the computer-generated printouts for distribution. The three types of functions for which information is prepared and packaged are treated separately in the discussion which follows.

Public Information/Relations

This function is one of keeping the general public informed about the needs and achievements of vocational education. The information must be packaged in as simple and efficient a way as possible. Very elementary visual displays such as charts and graphs are highly recommended. Starr et al. (1979, p. 61) state:

> Whether graphic or tabular techniques are used, three factors underlie satisfactory display of quantitative data: simplicity, clarity, and effectiveness. The graphic and tabular forms of data display must be easily read and understood, and must be presented in a manner which will facilitate ease of comprehension and retention. These purposes require consideration of: (a) the nature of the data; (b) the purpose of the display; (c) the medium for presenting the data; and (d) the audiences to whom the data are presented. One or all of these factors may be pertinent to any situation where data are presented or displayed.

After the visual display is completed, it should be examined carefully with the following questions in mind:

1. Does it convey the intended message?
2. Does it display the relationship clearly?
3. Can it be displayed differently?
4. Does it have eye appeal?

Although these are basic requirements, more often than not individuals packaging information do not address the foregoing questions, and thus run the high risk of failing to communicate effectively to the intended audience.

Administrative Decision Making

Many decision makers do not have time to do extensive reading and analysis, because of their responsibilities and priorities. Therefore, it is a waste of time and effort to provide these individuals with extensive sets of unsynthesized data (see table 7), expecting them to do their own analysis of outcomes as they relate to problems they are trying to solve. Decision making information that is provided to managers should be synthesized and packaged (see table 8) into a very practical, usable, acceptable form. Charts and tables of data need to be clear and concise for immediate understanding.

A great deal of responsibility rests on the shoulders of the evaluator or data analyst, who primarily bear the responsibility for interpreting and packaging the information for dissemination.

Program Decision Making

As indicated earlier, at the local level and at the state level, for those concerned with individual program areas in development and improvement, the detailed report and executive summary should be minimal requirements. Depending on individual requirements as negotiated by the evaluator and the client(s), the raw data and processed information may also be prepared for individual institutions and agencies.

Care must be taken to maintain confidentiality of data and information. At a minimum, schools should receive all information and data recorded about their own programs as well as summary data for the LEA and region as a whole. Consideration may also be given to the grouping of schools by certain characteristics such as size, demographics, or socioeconomic characteristics. Care should be exercised in sharing the detailed data/information from individual schools with other schools. Attention must be given to federal legislation requirements protecting the confidentiality and privacy of individuals.

Summary

In summary, interpretation and packaging of data and information on students' satisfaction with their training and jobs require strict attention to the needs and characteristics of the audiences for which the information is being prepared. Table 9 identifies general factors to be observed in organizing and formatting a report, and considerations for the graphic display of data.

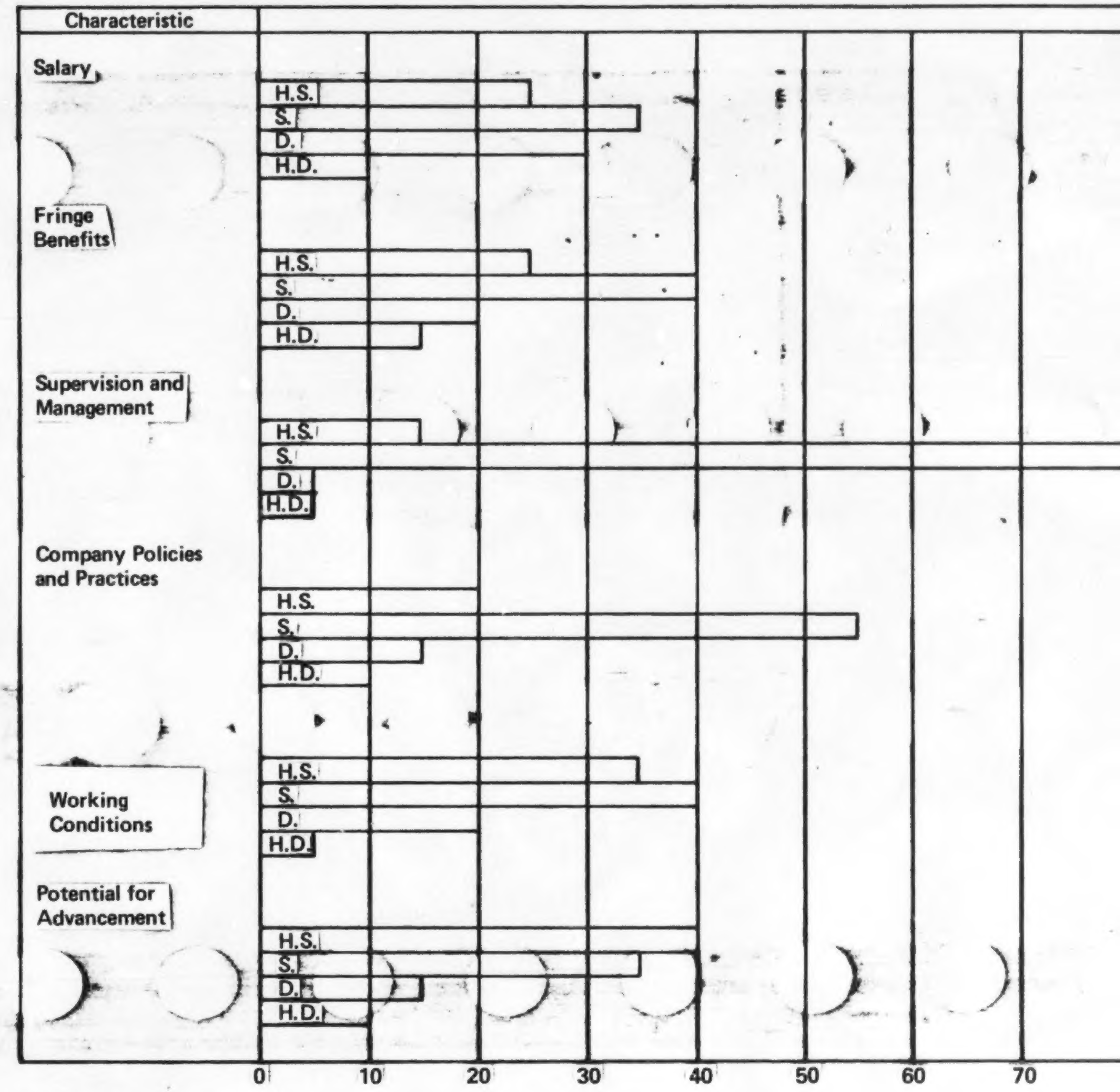
TABLE 7

Job Satisfaction Characteristics by Degree of Satisfaction of Technical Program

Characteristic	Count Row Pct Col Pct Tot Pct	Highly Satisfied	Satisfied	Dissatisfied	Highly Dissatisfied	Row Total
		1.00	2.00	3.00	4.00	
Salary	1.00	5	7	6	2	
		25.0	35.0	30.0	10.0	2.0
		15.6	12.5	28.6	18.0	16.7
		04.2	5.8	5.0	1.7	2.0
Fringe Benefits	2.00	5	8	4	3	
		25.0	40.0	20.0	15.0	2.0
		15.6	14.3	19.0	27.3	16.7
		4.2	6.7	3.3	2.5	
Supervision and Management	3.00	3	15	1	1	
		15.0	75.0	5.0	5.0	2.0
		9.4	26.8	4.8	9.1	16.7
		2.5	12.5	0.8	0.8	
Company Policies and Practices	4.00	4	11	3	2	
		20.0	55.0	15.0	10.0	2.0
		12.5	19.6	14.3	18.2	16.7
		3.3	9.2	2.5	1.7	
Working Conditions	5.00	7	8	4	1	
		0.35	40.0	20.0	5.0	2.0
		0.22	14.3	19.0	9.1	15.7
		0.06	6.7	3.3	0.8	
Potential for Advancement	6.00	8	7	3	2	
		0.40	35.0	15.0	10.0	2.0
		0.25	12.5	14.3	18.2	16.7
		0.07	5.8	2.5	1.7	
Column Total		32	56	21	11	12.0
		26.7	46.7	17.5	9.2	100.0

TABLE 8

Degree of Job Satisfaction of Former Technical Students by Characteristic



H.S. – Highly Satisfied
S. – Satisfied
D. – Dissatisfied
H.D. – Highly Dissatisfied

Percentage of Respondents

TABLE 9

Factors to Consider in Preparing Reports on Former Students' Satisfaction with their Training and Job

1. Include the survey instruments in all reports and presentations, if possible.
2. Set up local reports based upon local requirements, but also include information required by state and federal mandates that relates to local programs receiving state and federal support.
3. Break out and analyze data as much as possible, but not all information and analyses need be presented to everyone.
4. Make tabular summaries in the shortest possible form. Oral presentations are best with this type of information. Follow survey form design when making presentation: question 1, 2, 3, etc.
5. Prepare and present a copy of the report for each member of the audience during oral presentations, if practical. Be sure to present data in the form and content applicable to the particular audience.
6. Summarized reports are usually the best format for presentation to most groups; however, more definitive information is required in certain instances.
7. The comments section of a survey instrument is very important. This area many times reveals needs and shortcomings, especially if a particular comment is repeated several times.
8. Scan the comments section for the most frequently mentioned items, and make summaries for inclusion in reports and presentations. Refrain from using actual names (of teachers, administrators, etc.) given in comments.
9. Do not attempt to include survey information from a student surveyed in the wrong curriculum area. For example, students are sometimes included in vocational surveys who may have taken only one vocational course and who are, in fact, pursuing college prep courses. Their inclusion in a vocational survey biases the information and increases response error.
10. Data tabulation and analysis methods must be appropriate, or nonuse of the data is assured.
11. Break out district data on a per-school or program-per-campus basis. Most administrators are interested in information about their institution and their graduates. Compare schools to county data, or program to program data; but avoid institution-to-institution comparisons.
12. Break out data by program, where applicable. This format is very meaningful for vocational reports and presentations. It gains teacher support for the activity.
13. Compare and present data by courses and programs, not teachers. Many students react to questions about courses or programs by nature of their relationship with a teacher, and this tendency biases the data.
14. Keep any sophisticated statistics in a separate section for those who wish to review them, but do not present statistics throughout the report. Rates of use will go down, especially in audiences with little or no background in research methodology.
15. Percentages, graphs, and charts are information display methods to which most populations best relate.
16. The main use of follow-up information, as it currently exists, is to disseminate general indications of the condition of an institution, district, etc. Include an abstract of each report that summarizes these findings and gives a brief description of the information gathering/analysis techniques.
17. Make sure reports appear neat, are printed on good quality paper, and are in readable form.

Franchak, S. J. and Spirer, J. *Guidelines and Practices for Follow-up Studies* (Columbus, Ohio: The National Center for Research in Vocational Education, The Ohio State University, 1979), p. 127.

GLOSSARY

Case Study Method. A case study is an intensive, detailed analysis and description of a single organism, institution, or phenomenon in the context of its environment. The term has long been associated with law, medicine, and social work. The case study is also considered a legitimate method of inquiry in the social sciences and frequently is extended to several cases at once (Anderson et al. 1975, p. 46).

Data Preparation. The data collected in an evaluation have to be organized to make them readily accessible and usable. When the evaluation is small in scale (few subjects, few measures, simple design), the problems of data preparation are usually not great. However, as the size of the evaluation increases, so do the problems of data preparation. Whether data are hand-scored, keypunched, or optically scanned, they first need to be prepared to ensure good-quality data sets and efficient data analyses. Data preparation includes all steps taken to anticipate the needs of anyone working with data at some future time (Anderson et al. 1975, p. 112).

Descriptive Statistics. It is a field of statistics which is concerned primarily with summarizing data systematically for ease of comprehension (Anderson et al. 1975, p. 400).

Inferential Statistics. It is a field of statistics which is concerned with using data as the basis for making certain generalizations and interpretations (Anderson et al. 1975, p. 400).

Interviewing. It is a common form of collecting data employed in survey research. Data are collected by asking questions of people.

Multivariate Analysis. It refers to a series of statistical techniques used for analyzing a set of outcome variables observed on a number of students or experimental subjects. The dependent variables are analyzed with reference to one or more independent variables (Anderson et al. 1975, p. 250).

Quasi-Experimental Design. To paraphrase Campbell and Stanley, there are many education and training situations in which the evaluator can introduce something like *experimental design* but where he lacks control over when students are exposed to the program or which students are exposed to it, including the inability to assign students at random to experimental and control groups. Collectively, such situations may require the use of compromise procedures called quasi-experimental designs (Anderson et al. 1975, p. 301).

Questionnaires. A questionnaire is a group of printed questions used to elicit information from respondents by means of self-report. The questions may be open-ended, requiring respondents to select one or more answers from among those provided. The respondents may also be provided with checklists or rating scales. Questions may be concerned with the respondent's personal background, factual knowledge, or attitudes and opinions (Anderson et al. 1975, p. 311).

Special Needs. Persons who meet the requirements under the law for one of the categories (handicapped, of limited English-speaking ability, disadvantaged [economic and academic]) whether or not special services are provided by vocational education per se (Franchak and Spirer 1978, p. 159).

Univariate Procedures. It refers to a series of statistical techniques used for analyzing a dependent variable, regardless of the number of independent variables.

Unobtrusive Techniques. Data collection techniques that do not require contact with individuals—observation, physical trace, and archives or records (Kester 1975, p. 53).

ANNOTATED BIBLIOGRAPHY

Job Satisfaction

Anthony, W. P. "The Study of the Effectiveness of Public Postsecondary Vocational-Technical Education in Preparing Graduates for the Labor Force." Ph.D. dissertation. The Ohio State University, 1971.

Purpose of the study was to determine the extent to which public postsecondary vocational-technical education leads to success in the labor market. Data were collected from graduates of the Columbus, Ohio, Technical Institute (CTI), and Columbus, Ohio, Public High School graduates. Job satisfaction for all jobs and present job was assessed by asking the graduates to respond to one question, "On the whole, were you satisfied with the work?" 1—very satisfied, 2—satisfied, 3—dissatisfied, 4—very dissatisfied. Findings included: (1) There is not a significant difference between the job satisfaction of the CTI graduates and job satisfaction of the high school graduates. An overall conclusion reached by the author was: "CTI graduates were more satisfied with their present jobs and were more likely to remain with each employer for a longer period of time."

Ballo, Gary R. "A Comparative Follow-Up Study of Graduates and Non-graduates from the Vocational Division of the Lewis-Clark Normal School." Lewiston, ID: 1971, Lewis-Clark Normal School.

This study sought to compare graduates and nongraduates of the vocational division of Lewis-Clark Normal School. The sample consisted of students who attended vocational programs at LCNS from 1966-1970. Graduates were those who received a certificate or degree, nongraduates were identified from program and school records. Job satisfaction was operationalized by having students indicate the extent to which they "liked" their present occupation and present job. There was no significant difference between graduates and nongraduates with respect to job satisfaction.

Bouchard, T. J., Jr. "Field Research Methods: Interviewing, Questionnaires, Participant Observation, Systematic Observation, Unobtrusive Measures." In *Handbook of Industrial and Organizational Psychology*. Edited by Marvin D. Dunnette. Chicago, IL: Rand McNally College Publishing Company, 1976.

In this chapter, the special characteristics of field settings and the difficulties that research in such settings entails were reviewed. When compared to research in laboratory settings, it was concluded that for many purposes field studies could generate extremely useful, practical, and theoretical knowledge. Five major field methods were described in considerable detail. None of the methods were evaluated relative to each other, however, because the author believes that there is no single best method, in any absolute sense.

Burgess, Dale E., ed., Michigan Department of Education, Vocational-Technical Education Service Follow-up Survey of 1978 Graduates for Warren Consolidated Schools. Warren, MI: Warren Consolidated School District, 1978.

This study determined the relationship between secondary education programs and employment, job satisfaction, earnings, and/or further education. Another purpose was to obtain graduates' evaluation of their training and information for planning and development. All 1978 secondary graduates from the Warren Consolidated School district were contacted by mail or telephone. Job satisfaction was measured by asking participants how satisfied they were overall in their present job. 47 percent of vocational graduates reported that they were "very satisfied" with their jobs compared to 37 percent among nonvocational graduates.

Casey, F. M., ed., *Work Attitudes and Work Experience: The Impact of Attitudes on Behavior.* Washington, D.C.: U.S. Department of Labor, 1979.

This monograph describes the findings of a special exploration of data from the National Longitudinal Survey (NLS), a 15-year study of the attitudes and work experience of four age-sex groups: men aged 45 to 59, women aged 30 to 44, and young men and women aged 14 to 24 years at the date of the initial interviews. This special effort further subdivided these four groups by race and examined the interaction of work-related attitudes and subsequent behavior for each of the eight resulting age-sex-race groups.

The findings reported here represent an important step forward in research concerning worker motivation, since they make it clear that attitudes do influence subsequent work behavior. Specifically, it was established that individuals who felt they could influence their future through their own efforts later experienced greater success in the labor market than those who were less optimistic. Similarly, the relationship between job dissatisfaction and turnover was clearly marked in each of the eight age-sex-race groups. The evidence also indicates that dissatisfaction results in extensive costs borne by workers in terms of increased unemployment, decreased labor force participation, below-average growth in annual earnings, and a lower rate of promotion. For women in particular, their degree of commitment to work, their attitudes toward the propriety of mothers' working, and their husbands' attitudes toward wives' labor force participation all bore a measureable relationship to subsequent work experiences.

Conroy, William G., Jr.; Diamond, Daniel E. "The Impact of Secondary School Occupational Education in Massachusetts." Lowell University, MA: College of Management Science, 1976.

The study examined the impact of various secondary school programs upon the lifestyle of students. Primary attention was focused upon school-labor market relations. A probability sample was drawn from students who had been enrolled in secondary occupational and nonoccupational programs in Massachusetts. Job satisfaction was one of the outcome variables examined and was operationalized by a "very satisfied; satisfied; not satisfied" questionnaire item. Occupational students proved to have slightly higher job satisfaction than nonoccupational students.

Dawis, R. V. "The Work Adjustment Project." In *Programmatic Research and Development in Education.* Edited by F. C. Pratzner and J. P. Walker. Columbus, OH: The Center for Vocational and Technical Education, 1972.

Dawis described the continuing programmatic series of research studies on the general problem of adjustment to work. The project was characterized by a "circular" model of research and development and illustrates an overall "linear" progression through three stages of activity.

The circular model of research and development on work adjustment involves the interaction and interplay of three components: theory, methodology, and data. Some of the developmental implications which resulted from activity on each of the components were illustrated by reference to the Work Adjustment Project.

The Work Adjustment Project was further described as having moved linearly through three stages of development: an exploratory stage where guidelines for research and development are established and the boundaries of the problem area are described; a descriptive state where the problem area is further delineated to produce a "map" (theory) to represent and guide action; and finally a testing stage, consisting of several substages, in which the model or map is refined and improved through test, revision, and re-test sequences.

Several alternative directions for future research and development were identified and briefly discussed.

Feltsenhausen, Joyce L., et al. "Follow-Up Report on Illinois 'Class of '71' Occupational Program Alumni, Final Report." Eastern Illinois University, Charleston, IL: Center for Educational Studies.

The stated objectives of the study were to develop a follow-up data system and to test the system by conducting an extensive follow-up study of the relatedness of occupational programs and labor market experiences. Respondents included all occupational program graduates from 20 percent of Illinois schools in 1971 and their employers. Job satisfaction was operationalized by graduates giving their perception of factors that contributed to job satisfaction and dissatisfaction in their first jobs. They also gave an overall assessment of their job satisfaction. Sixty-seven percent of respondents indicated high or very high job satisfaction. Level of job security, salary, and possibilities for advancement were named most often both as satisfiers or dissatisfiers.

Gruneberg, M. M. *Understanding Job Satisfaction.* New York, NY: John Wiley and Sons, 1979.

This is an introductory book on job satisfaction. Chapter 1 introduces the topic and its historical context. The next chapter examines the different theories of job satisfaction. The next three chapters, 3, 4, and 5, explain the factors affecting job satisfaction. Chapter 6 examines the consequences of job satisfaction and dissatisfaction, and chapter 7 examines ways of improving job satisfaction through the redesigning of jobs.

Hernstadt, Irwin L.; Horowitz, Morris A.; and Sum, Andrew M. "The Transition from School to Work: The Contributions of Cooperative Education Programs at the Secondary Level." Boston, MA: Northeastern University, 1979.

This study tested the efficacy of different secondary school programs in preparing students for a successful labor market role. It was divided into two parts focusing on the graduating classes of 1966 and 1972. Samples were drawn from nine Boston area high schools and included students from cooperative vocational education programs, regular vocational education programs, and general academic programs. Job satisfaction was measured by respondents indicating "satisfied, dissatisfied, or unsure" as to their first job and employer. The finding was that graduates of the cooperative programs were significantly more satisfied with their jobs than were graduates of the other programs. The author suggests that this may partly be due to cooperative students having more clearly defined occupational objectives than the other graduates.

Katz, Douglas S.; Morgan, Robert L.; and Drewes, D. W. "Vocational Education and Urban Youth: A Follow-Up Study of 1968, 1971 and 1972 Graduates of the Public Schools of the District of Columbia." Raleigh, NC: Center for Occupational Education, North Carolina State University, 1974.

The study aimed to specify the design for a follow-up system for the District of Columbia Public School System. Data were collected by telephone survey. The deliverative/purposive sample was drawn from graduates of Washington D.C. public vocational and academic high schools. Measures of job satisfaction included how satisfied employed vocational graduates were with their jobs, whether they would take the same job again, and whether they would recommend their job to a friend. Significant findings were as follows: (1) ninety percent of vocational graduates were satisfied with their jobs, and (2) sixty percent said they would strongly recommend their job to a friend.

Kaufman, Jacob J., and Lewis, Morgan V. "The High School Diploma: Credential for Employment?" V. Park, PA: Institute for Research on Human Resources, The Pennsylvania State University, 1972.

The stated objective of the study was to test the hypothesis of credentialism where people are evaluated with respect to the credentials they hold, in this case the high school diploma. The sample was comprised of interested students from 1,200 dropouts who were randomly assigned to either a general education or a skill training program. Job satisfaction was operationalized by student/employees rating their jobs according to work, pay, hours, supervision, opportunity, coworkers, and respect. Both groups were found to be very similar in terms of job satisfaction.

Locke, E. A. "Nature and Causes of Job Satisfaction." In *Handbook of Industrial and Organizational Psychology.* Edited by M. D. Dunnette. Chicago, IL: Rand McNally College Publishing Company, 1976.

This chapter starts with a historical overview of major theories of job attitudes, including those of Scientific Management, the Hawthorne Researchers, and Cognitive Growth advocates. The concept of job satisfaction is then analyzed and distinguished from related concepts. After basic job dimensions affecting job attitudes are discussed, the major process and content theories of job satisfaction are critically analyzed. Major findings concerning both the causes and effects of job satisfaction are then summarized. Sections on measurement problems and research strategies in the study of job attitudes are followed by recommendations for future research.

McCowan, Richard J.; Mongerson, M. Duane; and Carter, Donald E. "Occupational Education: A Survey of Secondary School Graduates in New York State." Buffalo, NY: State University College, 1971.

The study analyzed the educational and occupational patterns of New York high school 1969 graduates from occupational programs. Data were collected by mail survey. Job satisfaction was measured by asking respondents to indicate whether they liked or disliked their present jobs. Of the graduates, 83.5 percent indicated satisfaction.

Market Opinion Research, "Employers and Young Adults Look at Vocational Education." Columbus, OH: Ohio Advisory Council for Vocational Education, Columbus, Ohio, 1977.

The purpose of the study was to determine the effects of vocational education on employability, job satisfaction, student satisfaction with training, and employer satisfaction with training. The sample consisted of graduates of Ohio vocational education and other curricula programs. Employees and employers were matched in pairs for interviews. Job satisfaction was operationalized by students responding in a Likert scale to twenty-five job satisfaction related questions or statements such as "my job is boring". Findings were that job satisfaction was the most significant difference between vocational graduates and other graduates. Vocational graduates feel that they have a better future in their jobs, and are less inclined to change jobs, and try harder to do quality work.

Quinn, Robert P., and Baldi De Mandilovitch, Martha S. *Education and Job Satisfaction: A Questionable Payoff.* NIE Papers in Education and Work: No. 5. Washington, D.C.: U.S. Department of Health, Education, and Welfare, The National Institute of Education, March 1977, pp. 69 (ED 129 702).

This report examines (1) the assumption that the better the education, the greater the chances of securing a desirable, satisfying job, and (2) the social and psychological processes that may link education and job satisfaction. Sources of information used for the study include sixteen previously published research reports bearing either directly or indirectly on the relationship between education and job satisfaction and secondary analyses of nine national surveys designed for purposes other than understanding the relationship between education and job satisfaction.

Five of the sixteen studies found a positive association between education and job satisfaction, three found a negative association, and eight reported the relationship to be either nonexistent or equivocal. Analyses of the nine national surveys found no increment in job satisfaction with succeeding years of education. However, while no relationship was found between education level and job satisfaction among workers who had not gone to college, those who had obtained college degrees were consistently more satisfied with their jobs than were employees without degrees. All but one of the surveys identified "credentials effect," evidence that there was no payoff in job satisfaction from having college training unless one also received a college degree. Level of education was significantly and positively related to overall quality of employment, and the greatest increment in quality of employment occurred at those points where educational credentials were conferred.

The report concludes with several recommendations for further research and for policy changes on the part of employers and educators. Among the recommendations for policy changes are the following:

- Employers and educators should be aware of the occupational needs of the over-educated.
- The educational requirements established for jobs should be reexamined.
- Job design, where possible, should take into account the increasing education level of the labor force.
- Educators should place greater emphasis on general skills, anticipating the many job changes in life.
- Training for specific jobs should be reserved until it becomes necessary for the worker to receive such training.
- Educators should not justify "every unpleasant thing in school" as essential for securing a good job.

Quinn, R. P., and Stanes, G. L. *The 1977 Quality of Employment Survey.* Ann Arbor, MI: Institute for Social Research, 1979.

This volume contains descriptive statistics on the 1977 quality of employment survey with comparison data from the 1969-70 and the 1972-73 surveys. The measurement of job satisfaction was approached in two ways: first, with a general set of facet-free questions phrased so that workers can invoke any considerations of their choice; second, with a series of questions about specific facets of the worker's job and employment conditions (e.g., pay, hours, etc.). Responses to the general questions were averaged to form an index called "Facet-free Job Satisfaction." The specific responses were clustered by topical (and statistical) similarity, with indexes for each topic and also one for all topics combined ("Facet-specific Job Satisfaction"). The topical areas are: Comfort, Challenge, Financial Rewards, Relations with Coworkers, Resource Adequacy, and Promotions. With the addition of an overall index ("Overall Job Satisfaction") combining Facet-free Job Satisfaction and Facet-specific Job Satisfaction.

Richardson, William B. "An Analysis of Factors Influencing the Earnings of Indiana High School Vocational Graduates." Indianapolis, IN: Indiana State Department of Public Instruction, Division of Vocational Education, 1975.

The purpose of the study was to quantify the relationships between earnings of Indiana vocational graduates and selected variables hypothesized to affect those earnings. Job satisfaction was operationalized with an item asking respondents to indicate their feelings toward their present job as "Highly like," "Moderately like," "Indifferent," or "Dislike." Conclusions were that persons who like their present jobs earn significantly more than those who are dissatisfied and that student satisfaction with training does little to explain earnings differentials.

Weiss, D. J. "Multivariate Procedures". In *Handbook of Industrial and Organizational Psychology.* Edited by Marvin D. Dunnette. Chicago, IL: Rand McNally College Publishing Company, 1976.

Methods of multivariate covariation analysis (factor analysis, cluster analysis) are classified and explained in nonmathematical terms, within the context of research in industrial–organizational psychology. Classification schemes used are designed to assist the researcher in choosing methods most appropriate for a given applied problem. Decision criteria used in choosing among multivariate prediction models are based on whether the criterion variable is single or multiple and whether it is continuous or categorical, and whether the researcher is willing to assume linear relationships between the set of multiple predictors and the criterion variable(s). Each method is discussed in terms of its rationale, interpretations, and limitations. Methods for analyzing matrices of multivariate correlational data are divided into those methods that analyze total variance (components analysis and cluster analysis) and methods for analyzing common variance (factor analysis). Within each of these major classifications additional distinctions are made among available techniques to help researchers identify the methods most appropriate for a given problem and to assist in the interpretation of the results of analyses using the methods.

Von Stroh, Gordon E. "A Socio-Economic Study of Vocational-Technical Education Students." Oklahoma: University of Oklahoma, 1968.

This study examined a number of vocational education outcome variables, among them job satisfaction and student satisfaction with training. The sample was drawn from graduates and dropouts from a single vocational-technical school in Oklahoma. Data were collected by questionnaire. Job satisfaction was operationalized by a single categorical item, "Satisfied/Not Satisfied." It was found that 70 percent of the respondents were satisfied with their job.

Student Satisfaction with Training

Anthony, W. P. "The Study of Effectiveness of Public Postsecondary Vocational-Technical Education in Preparing Graduates for the Labor Force." Ph.D. dissertation. The Ohio State University, 1971.

The study determined the extent to which public postsecondary vocational-technical education leads to success in the labor market. Data were collected from graduates of the Columbus Technical Institute, and Columbus, Ohio Public High School graduates. Student satisfaction with training was operationalized by having respondents rate various aspects of their training such as instruction, facilities, counseling, etc., on a four-point scale. Overall ratings given by CTI graduates were slightly higher than those given by high school graduates.

Ballo, Gary R. "A Comparative Follow-up Study of Graduates and Non-graduates from the Vocational Division of the Lewis-Clark Normal School". Lewiston, ID: Lewis-Clark Normal School, 1971.

This study compared graduates and non-graduates of the vocational division of Lewis-Clark Normal School. The sample consisted of students who attended vocational programs at LCNS from 1966-1970. Graduates were those who received a certificate or degree, nongraduates were identified from program and school records. Student satisfaction in training was operationalized by students indicating "excellent, good, satisfactory, or poor" in appraisal of their programs' instructional and counseling components. Students also responded to questions regarding how well the program prepared them for their first job, and whether they felt they received their money's worth. There was no significant difference between graduates and nongraduates in their evaluation of instruction and counseling. Over 90 percent of both groups felt that they received their money's worth and that the program prepared them well for their first job.

Burgess, Dale E., ed., Michigan Department of Education, Vocational-Technical Education Service Follow-up Survey of 1978 Graduates of Warren Consolidated Schools. Warren, MI: Warren Consolidated School District, 1978.

This study determined the relationship between secondary education programs and employment, job satisfaction, earnings, and/or further education. Another purpose was to obtain graduates' evaluations of their training and information for planning and development. All 1978 secondary graduates from the Warren Consolidated School District were contacted by mail or telephone. Students' satisfaction with training was measured by participants responding to the question, "How well did your courses prepare you to do what you are doing now?". Sixty-six percent of vocational graduates were "very satisfied" with their training compared to 60 percent among nonvocational graduates.

Career and Vocational Education Section, Oregon Department of Education, "Follow-up of 1977 Secondary Vocational Program Graduates and Early Leavers". Salem, OR: Oregon Department of Education, 1978.

The study assessed the relatedness of school programs to students' job and how well school experiences prepared students for their first jobs. Student satisfaction with training was also assessed. All graduates and early leavers of Oregon's high school class of 1977 were surveyed by mail. Students were asked to what extent their present job was related to the training they had received. They also evaluated student services, job skill preparation, and preparation for further education. A majority of respondents rated their job preparation as either satisfactory or excellent. The most significant finding was that students who took more vocational courses had jobs that were more related to their training.

Feltsenhausen, Joyce L., et al. "Follow-Up Report on Illinois 'Class of '71' Occupational Program Alumni, Final Report." Eastern Illinois University, Charleston, IL: Center for Educational Studies.

The stated objectives of the study were to develop a follow-up data system and to test the system by conducting an extensive follow-up study of the relatedness of occupational programs and labor market experiences. Respondents included all occupational program graduates from 20 percent of Illinois schools in 1971 and their employers. Student satisfaction with training was operationalized by graduates rating the helpfulness of their training in preparing them for employment. These assessments tended to be very low. The only area in which the ratings were high was use of tools and equipment.

Gammel, Jeanne M.; Brodsky, Stanley; and Alfred, Richard. "Follow-up Study of 1969-1975 Graduates of the Division of Technology of New York City Community Colleges." Brooklyn, NY: New York City Community Colleges, 1976.

The purpose of the study was to examine the attitudes and postcollege experiences of technology graduates at New York included in the study and were surveyed by mail. Student satisfaction with training was measured by graduates indicating how helpful their training had been in getting their first job, how helpful their training was in performing their first job, and whether or not they would recommend their program to a friend. Findings varied among program areas but over 50 percent in all areas felt their program had been helpful in getting and performing their first job. Electrical technology graduates had higher than average perceptions of the value of their training while architectural technology graduates gave a lower evaluation. Over 80 percent of graduates in all areas said they would recommend their program to a friend.

Hall, Wilbur; Gray, Rodney; and Berry, Arthur. "Follow-up Study of Machine Tool Technology and Building Construction Graduates." South Portland, Maine: Southern Maine Vocational Technical Institute, 1975.

The purpose of this study was to assess the labor market experiences of building construction and machine tool technology graduates of Southern Maine Vocational Technical Institute from 1970, 1972, and 1974. Information for program evaluation was also solicited from graduates. All graduates from the above years were surveyed by mail or interviewed. Respondents indicated their overall satisfaction with training and also their satisfaction with instruction and training equipment. A majority of graduates rated their training as excellent or very good. A majority felt that the equipment used during training was similar to that used on the job and 74 percent found it easy to adapt to industrial equipment. Instructors were rated as very knowledgeable by over 90 percent of all graduates.

Hanby, Jeanette; Harper, Ronald; and Myers, Leo. "A Comparison Study of the Benefits of Secondary and Postsecondary Vocational Education." Portland, OR: Northwest Regional Education Laboratory, 1978.

The purpose of the study was to assess graduates' perception of their training, employers' assessment of graduates' training, and to conduct a comparison of perceptions of quality of life. The student sample was selected from Montana High School graduates who had been employed in Montana at least two years. Employers who often hire vocational education graduates were selected to represent various sizes and types of businesses. Data were gathered through telephone surveys and mail questionnaires. Student satisfaction with training was operationalized by asking students to rate their vocational programs as "excellent, good, fair, or poor." Ratings for postsecondary programs were highest with ratings for secondary vocational education programs and general academic programs being about the same. However, more postsecondary graduates than secondary vocational graduates expressed a need for more experience during training.

Hernstadt, Irwin L.; Horowitz, Morris A.; and Sum, Andrew M. "The Transition from School to Work: The Contributions of Cooperative Education Programs at the Secondary Level." Boston, MA: Northeastern University, 1979.

This study tested the efficacy of different secondary school programs in preparing students for a successful labor market role. The study was divided into two parts focusing on the graduating classes of 1966 and 1972. Samples were drawn from nine Boston-area high schools and included students from cooperative vocational education programs, regular vocational education programs, and general academic programs. During a final interview students were asked to assess the effectiveness of their high school programs. Significantly more cooperative and regular vocational education students felt they had been "very well" or "well" prepared for work than did general academic graduates. More than 50 percent of the general academic graduates felt they had been "unprepared" or "very poorly prepared" for work.

Hodges, Stanley L. "Emplovee-Employer Assessment of the Effectiveness of Agricultural Mechanics Training Received at Modesto Junior College." Unpublished dissertation, 1973.

The stated purpose of the study was to gather information regarding the quality of job preparation offered by the Agricultural Mechanics program at Modesto Junior College from the perspectives of former students and their employers. All Agricultural Mechanics majors who graduated from Modesto Junior College between 1965 and 1972 and their employers were surveyed by mail. Student satisfaction with training was operationalized by having students indicate where they felt they learned most about their skill. Choices were high school, Modesto Junior College program, apprenticeship program, on-the-job, and elsewhere. In all nine skill areas the majority of former students said they felt they learned more at Modesto Junior College.

Kaufman, Jacob J., and Lewis, Morgan V. "The High School Diploma: Credential for Employment?" V. Park, PA: Institute for Research on Human Resources, The Pennsylvania State University, 1972.

The stated objective of the study was to test the hypothesis of credentialism where people are evaluated with respect to the credentials they hold, in this case the high school diploma. The sample was comprised of interested students from 1,200 dropouts who were randomly assigned to either a general education or a skill training program. Student satisfaction in training was operationalized by students rating the relatedness of training to their first job and the extent to which they felt the program improved them personally and/or vocationally. Findings were that general education students found the programs more worthwhile but both groups were generally critical of the programs.

Katz, Douglas S.; Morgan, Robert L.; and Drewes, D. W. "Vocational Education and Urban Youth: A Follow-up Study of 1968, 1971, and 1972 Graduates of the Public Schools of the District of Columbia." Raleigh, NC: Center for Occupational Education, North Carolina State University, 1974.

The purpose of the study was to specify the design for a follow-up system for the District of Columbia Public School System. Data were collected by telephone survye. The deliverative/purposive sample was drawn from graduates of Washington, D.C. public vocational and academic high schools. Student satisfaction with training was measured by a survey of graduates in which they rated instruction, course offerings, facilities, equipment, and the degree to which their education had prepared them for a job. Significant findings were as follows: (1) a higher proportion of vocational graduates than academic graduates were satisfied with their wages, and (2) vocational graduates were more positive than academic graduates regarding the quality of their high school education.

Quanty, Michael. "1975 Career Student Follow-up: Initial Placement." Overland Park, KS: Johnson County Community College, 1976.

The purpose of the study was to conduct an initial placement follow-up for all state-certified career programs at JCCC. Student satisfaction with training was operationalized requiring respondents to rate the Johnson County Community College program, indicating whether the coursework helped them obtain their job and indicating whether the program adequately prepares a person for this type of job. Sixty-seven percent indicated that the coursework helped them obtain their jobs.

Richardson, William B. "An Analysis of Factors Influencing the Earnings of Indiana High School Vocational Graduates." Indianapolis, IN: Indiana State Department of Public Instruction, Division of Vocational Education, 1975.

The study quantified the relationships between earnings of Indiana vocational graduates and selected variables hypothesized to affect those earnings. Student satisfaction with training was operationalized with a categorical "Satisfied/Dissatisfied" item. Conclusions were that persons who like their present jobs earn significantly more than those who are dissatisfied and that student satisfaction with training does little to explain earnings differentials.

Von Stroh, Gordon E. "A Socio-Economic Study of Vocational-Technical Education Students." Oklahoma: University of Oklahoma, 1968.

The purpose of this study was to isolate and examine a number of vocational education outcome variables, among them job satisfaction and student satisfaction with training. The sample was drawn from graduates and dropouts from a single vocational-technical school in Oklahoma. Data were collected by questionnaire. Student satisfaction with training was operationalized through several items regarding effectiveness of various aspects of vocational education programs. It was found that 70 percent of respondents were satisfied with their job, and also that 70 percent considered their training sufficient.

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